

SURGICAL EPITOME

BY

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Vol. II

N. M. TRIPATHI LTD.

PRINCESS STREET

BOMBAY

1944

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Price: Rs. 24-0-0
(For Two Vols)

First published 1944

Printed by V. V. Bambardekar at the India Printing Works,
9, Bakehouse Lane, Fort, Bombay, and Published by P. J.
Pandya for N. M. Tripathi Ltd., Princess Street, Bombay.

Dedicated

TO

MY DEAR FATHER

MR. VITHALRAO S. NADKARNI

Without whose selfless sacrifice, I could never have
been whatever I am.

"A real hero is seen more often in everyday life than on a battle-field ; in everyday quiet sacrificial sufferances than in temporary homicidal frenzy ; on the losing than on the winning side ; in darkness and obscurity than in sunshine and limelight. Look around with open eyes, and if you are fortunate enough, you will see one quite near you."

FOREWORD

It must be a matter of pardonable pride for a teacher to be requested to write a foreword to a book by one of his pupils. In the present instance it is also a pleasure to do so as the teacher realises that his student has been more industrious than himself.

Surgery cannot be learnt from text-books. It can only be learnt in the Out patients' Department and the wards of a hospital, under the guidance of a good teacher. A good clinical teacher alone can impress upon the student the value of accurate observations and the importance of a correct approach to a Surgical problem.

However, the time allotted to the teaching of Surgery in the University curriculum is hardly sufficient to enable the student to attain real proficiency in the subject. The present curriculum in Medicine as designed by the different Indian Universities is so overloaded, that it is safe to conclude that it is intended for super students. The average student is nightly haunted by the spectre of the approaching examination. He has no other alternative but to obtain the requisite knowledge from books. The ground that he has to cover in his readings is truly extensive. Unless the student has acquired the art of making his own notes, he will find it difficult to "brush up" the different subjects just before his examination.

It is at this juncture that Dr. Nadkarni's book will be found to be truly serviceable. As explained by the author in his very lucid preface, this book is an Epitome of Surgery. It is not intended to replace any of the good text-books in Surgery. "Surgical Epitome" will provide the means for a very rapid revision of this vast subject.

This book will also prove useful to a lecturer in Surgery in bringing before him, in a condensed form, the various points he would like to dilate upon.

I wish this publication all success.

PREFACE

Success depends, not on the possession of knowledge—however vast it may be—but on its ready presentation at the required moment; the ready presentation of the knowledge requires excellent memory, which, in its turn, is the outcome of repeated revisions. Repeated revisions of a subject,—especially of a vast subject like surgery—are possible only with its concised epitome. General reading of a vast subject is comparable to wandering in a dense jungle, exploring its depth, without leaving any marks for the return journey and thus losing one's way, while revisions of an epitome of the subject are just like a provision of landmarks for a path for safe return journey.

The author knows many a brilliant student whose main cause of failure was too much and too vast a reading, which naturally was beyond the capacity of digestion. Brain is a limited reservoir and after a certain limit, every fact impressed upon it, is at the cost of some other—perhaps more important—fact, which is effaced. So the brain should not be overcrowded with irrelevant and unnecessary facts lest important material may be lost in unnecessary details. The present epitome can be compared to a review, from an adjoining hillock, of a big city, strewn with familiar landmarks, which helps in giving a general idea of its whole geography.

The author attributes his humble success in academical and professional spheres to revisions—repeated revisions—of his subject. While he was a teacher of surgery in medical institutions at Bombay and Poona, he had made up his mind to guide his students along this principle, and the present book is the outcome of all the personal notes he had made for his examinations and teaching.

Due to vastness of the subject, the author has arranged the subject matter in two volumes. The whole subject has been divided into four parts. (1) Tissue Surgery—surgery of anatomical structures, (2) Regional Surgery—surgery of the

Loan Scheme ' some years back, which helped me to get the foreign qualifications, and gave me an opportunity of studying surgery in England and Vienna. I am sure that they will be proud to know of this outcome of their contributions and will feel that their trust, at the time, was not misplaced.

Last, but of course not the least, I thank the authors of all the English, American and Continental Surgical books, Monographs and Journals, to which I have made free references.

The very fact that the present work was in embryo for the last five years and in print for the last two years, will give an idea of the amount of work and toil behind it. But that is not all. The book and its author have been passing through an acute crisis in life, and it is a matter of great satisfaction and pride for the author and his helpers to see that the work is seeing the light of the day, inspite of heavy odds against them. The author fully apprehends the result of this hazardous venture taken up by him in these hard days, but sincerely thanks himself to be fully repaid if the work proves to be a benefit to a student and a follower of his dear subject.

POONA,
25th March 1944

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PART IV

SURGERY OF THE DIGESTIVE SYSTEM

CHAPTER I

SURGERY OF THE MOUTH CAVITY

(A) THE TEETH

(I) IMPACTED OR MISPLACED THIRD MOLAR:

Etio Adolescents

Path (A) **Abnormal gum :**

(a) Over growth of œdematous tags

(b) Non separated gums

(B) **Abnormal tooth :**

(a) Encroaching neighbour

(b) Abnormal posture

Clinic **Painful trismus in adolescents or adults**

Compl **Alveolar sepsis with its sequelæ**

Treat. (1) Excision of œdematous tags
(2) Incision or **excision of non separated gum**
(3) Extraction of encroaching neighbour
(4) Extraction of misplaced molar

Post. compl

(A) **Traumatic :**

(a) Hæmorrhage

(b) Fracture tooth with retention of root

(c) Trauma to

(a) Mandibular or lingual nerve

(β) Jaw fracture or dislocation

(B) **Infective :** Alveolar sepsis

(II) INJURIES OF THE TEETH:

(1) **Concussion :**

Def Tooth driven into its socket

Etio (a) Mouth gag

(b) Hard bite

Clinic Tender sensitive tooth

Compl (1) Traumatic cyst

(2) Pulpitis

(3) Degeneration

(2) **Fracture :**

Def Broken tooth

Etio Predisposer Caries

Exciting. (a) Blows

(b) Extraction

Sites (a) Crown

(b) Root

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Def. Broken tooth

Etio Predisposer Caries

Exciting (a) Blows

(b) Extractio

Sites (a) Crown

(b) Root

(3) Dislocation •

Varieties: (a) Partial loose tooth

(b) Complete

(4) Attrition and abrasion

(III) INFECTIONS OF THE TEETH:

(1) DENTAL CARIES

Etiology (a) Oral sepsis

(b) Mouth breathing

(c) Deficient enamel

(a) Lack of vitamin D } : Rickets

(β) Lack of calcium

Clinic (1) Odontalgia

(2) Inspection

Compl (a) Odontalgia

(b) Pulpitis

(c) Dento alveolar abscess:

(α) Acute

(β) Chronic

(d) Osteomyelitis jaw

(e) Regional lymphadenitis

Treat (1) Conservative:

(a) Application of anodynes

(b) Mouth gargles

(c) Stuffing

(2) Radical • Extraction (See under Operations)

Ind Sepsis beyond the tooth

(2) ALVEOLAR SEPSIS

Def Septic inflammation of the alveolus

Etiology Carious tooth • Especially stuffed

Path Septic inflammation

of (a) Peridental space

↓ (b) Bone socket → alveolus → jaw

↓ (c) Periosteum

↓ (d) Gums or subcutaneous tissues

Clinic (1) Local: Acutely painful inflammatory swelling of the alveolus → gums or cheek or sub-maxillary region

(2) Regional • Acute lymphadenitis

(3) General: Toxæmia

Compl (1) Gum boil

(2) Alveolar abscess

(3) Acute osteomyelitis jaw

(4) Acute regional lymphadenitis

(5) Cellulitis of the neck (Mandible)

↓ (a) Ludwig's angina

or (b) Oedema glottis

or (c) Mediastinitis

- (6) Cavernous sinus thrombosis } : (Maxilla)
 (7) Antral empyema }
 (8) Pneumonia
 (9) Septicæmia, pyæmia, toxæmia
- Sequelæ: (1) Chronic osteomyelitis jaw
 (2) Chronic lymphadenitis
 (3) Sinuses on the face or neck
- Treat: (1) Hot antiseptic mouth gargles
 (2) Gum boil:
- Treat: Incision and drainage
- (3) Alveolar abscess:
- (A) Within 24 hours + no localisation
 : Conservative treatment:
 (a) Hot antiseptic mouth-washes
 (b) Dover's powder
- (B) Local swelling:
 : Intra-buccal operative drainage:
- Anæsth: Evipan
- Tech. (1) Extraction of the tooth
 or (2) Incision of periost. on either side
 or (3) External drainage (avoid)
 Ind External pointing
 Tech Incision close under the lower border
 of the mandible

(3) ROOT ABSCESS:

(A) Acute:

- Etiology: (1) Impacted tooth
 (2) Caries tooth

Path: Pus under tension around the tooth root

Clinic: Severe toothache with toxæmia

Comp: Acute osteomyelitis jaw

Treat: Immediate extraction

(B) Chronic:

Etiology: Chronic non pyogenic streptococcal tooth infection

Path: Septic absorptive changes around the roots:

- (a) With pus
 (b) Without pus

Clinic: (1) Metastatic septic troubles:

. Arthritis, myositis, fascitis

(2) Radiography:

- (a) Diffuse bony absorption } around the
 (b) Abscess cavity } root

Treat: (1) Apicectomy

(2) Extraction

(4) MEDIAN MENTAL SINUS ·

Def: Paradental abscess in connection with the roots of the lower incisors, which has tracked down to the mental region

Clinic (1) Sinus over the symphysis menti

(2) Radiography

Treat Extraction of the offending tooth

(IV) NEW GROWTHS OF THE TEETH: Odontoma

Def. A tumour arising from a tooth germ or a developing tooth and composed of dental tissues in varying proportions and in different degrees of development

(A) Epithelial odontome :**(a) Dental cyst :**

(1) Single cyst

(2) Normally erupted carious tooth

(3) Upper jaw

(b) Dentigerous cyst: Follicular odontome

(1) Single cyst

(2) Un erupted tooth

(3) Lower jaw

(c) Multilocular cystic disease: Adamantinoma

(1) Multilocular, lobulated, central expansion
With egg shell crackling

(2) Many loose or fallen teeth

(3) Lower jaw

(d) Eruption cyst

Etio Delayed eruption

Path Stimulation of epithelium

Clinic Bluish swelling over a tooth in the process of eruption

(B) Connective tissue odontomes

(a) Fibrous Fibrous swelling with non-erupted tooth

(b) Cementome Bony swelling with non-erupted tooth

(C) Composite odontomes

Path (a) Disordered growth of tooth germ

↓ (b) Irregular conglomeration of

(a) Enamel

(3) Dentine

(v) Cement

Clinic Swelling containing conglomerate mass of denticles

(D) Compound follicular odontome

Path Multiple denticles surrounding a non erupted tooth, encapsuled
in fibrous or osseous capsule

Clinic (a) Solid swelling of the jaw

(b) Multiple un-erupted teeth

(E) Radicular odontome

Path Tumour in connection with a fang of a normally erupted tooth

Clinic (a) Normal tooth

(i) Solid swelling at the root

(F) Malignant odontome :

: Malignant degeneration of any of the preceding odontomes

Radiological pictures :

- (1) Cavity at the root of a normally erupted tooth .
 - (a) Root abscess
 - (b) Dental cyst
- (2) Cavity with a tooth inside .
 - (a) Un-erupted tooth
 - (b) Dentigerous cyst
- (3) Multilocular cavity with central expansion
: Multilocular cystic disease
: Myeloma
- (4) Bony shadow with non-erupted tooth inside .
Cementome
- (5) Mass of multiple denticles only .
: Composite odontome
- (6) Non-erupted tooth + multiple denticles .
: Compound odontome
- (7) Solid shadow from a fang of a normal tooth .
: Radicular odontome

Treatment of odontomes :

- (1) Scraping + Tr. iodine swab
- (2) Local excision
- (3) Excision of the jaw

(V) OPERATIONS ON THE TEETH :

Tooth Extraction :

- Pre oper . (1) X Ray
(2) Oral hygiene
- Tech : (1) Adaptation to the tooth
(2) Separation from the alveolus
(3) Removal from the socket
- Instr . (A) Upper teeth : Straight forceps
(B) Lower teeth : Hawk bill right angled forceps
- Points : (1) Do not include the gums in the grasp
(2) Do not apply the forceps between the roots
(3) Take a firm grasp of the base
(4) Movements to loosen the teeth .
(a) Incisors . rotatory
(b) Others . lateral leverage
(5) Examine every removed tooth for fracture
- Compl . (1) **Hæmorrhage :**
Etiology : (a) Hæmophilia
(b) Injury to alveolar vessels
Path : (1) Primary
(2) Reactionary

Treat: (A) Local:

- (1) Removal of loose bone fragments
- (2) Gauze pack with styptics:
 - (a) Adrenaline
 - (b) Snake venom: Stypten
 - (c) Ferropyrin
- (3) Mattress suture of gums
- (4) 'Stopper method':
 - (a) Gauze pack
 - (b) Dental stopper
 - (c) Fourtailed bandage

(B) General:

- (1) 20 c.c.s. of alien blood into rectus sheath
- (2) Intravenous calcium
- (3) Horse serum
Coagulen-'Ciba'
- (4) Blood transfusion

(C) Operative:

: Ligature of posterior palatine artery at the posterior palatine foramen

Ind: Bad hæmorrhage from upper jaw socket

- (2) Fracture tooth: With retention of root
- (3) Extraction of wrong tooth: replace immediately
- (4) Fracture or dislocation jaw
- (5) Trismus
- (6) Laceration of the gums
- (7) Swallowed tooth

(B) THE GUMS**(I) HYPERTROPHY OF THE GUMS:**

Etio: Mentally defective children or young adults

Clinic. Hypertrophied polypoid gums burying the teeth

Treat: Alveolectomy

(II) PERIODONTAL INFLAMMATION:**(I) GINGIVITIS:**

Def: Inflammation of the muco-periosteal layer which festoons the margins of the teeth

- Etio: (a) Gingival trough
 (b) Oral stagnation
 (c) General lowered resistance

Varieties: (1) Primary:

- (a) Non-specific: Oral sepsis
- (b) Specific. (a) Syphilis
 (β) Fusospirillary

(2) **Secondary :**

- (a) Non specific : (α) Pregnancy
 (β) Avitaminosis
 (γ) Blood diseases
 (b) Specific : (α) Mercury
 (β) Bismuth

(2) **PERIODONTITIS**

Def. Inflammation of periodontal membrane

- Etio (a) Traumatic
 (b) Chemical
 (c) Bacterial

- Varieties (1) Acute or chronic
 (2) Local or general

Clinic Raised tender tooth

- Compl (a) Exostosis of the root or cementosis
 (b) Rarefaction of the root

(3) **PARA ODONTAL INFECTION**

Syn **Pyorrhœa alveolaris :**

- Etio. (α) Elongation and loosening of the teeth
 (b) **Oral stagnation**

- Path. (1) **Marginal : Pyorrhœa alveolaris**
 (2) Proliferative Generalised cementosis
 . 'Gouty teeth'

- (3) Rarefying

Clinic Pus exuding from gingivo dental space

- Compl **Septic metastases :** (α) **Surgical dyspepsia**
 (b) Arthritis
 (c) Myositis and fascitis

- Treat (A) **Conservative :**
 (α) **Oral hygiene**
 (b) **Vaccine therapy**
 (B) **Operative**
 (α) Gingivectomy
 (b) Gingivoplasty

(4) **GUM BOIL .**

Def Collection of pus between a tooth and the gum

Etio. **Carious tooth**

- Clinic (α) Dental sepsis
 ↓ (b) Soft, local, fluctuating swelling under the
 gums, round about the carious tooth

- Treat : (α) Incision and drainage
 ↓ (b) Look for and remove carious bone

After treat . Antiseptic mouth washes

(III) **EPULIS :**

Def. Swelling . (α) Arising from the alveolus

- Varieties (1) **Granulomatous :**
 (2)
 (3)
 (4) **Myelomatous :** Alveolar myeloma
 (5) **Carcinomatous** Carcinoma gums

(IV) BLEEDING GUMS:

- (1) **Pyorrhœa alveolaris**
 (2) **Scurvy**
 (3) **Purpura**
 (4) **Hæmophilia**
 (5) **Granulomatous epulis**

(C) THE JAWS

(I) CONGENITAL AFFECTIONS:

CLEFT PALATE

- Eti** (1) **Hereditary**
 (2) **White races**
 (3) **Males**
- Varieties** (1) **Rudimentary uvula :** With short soft palate
 (2) **Bifid uvula**
 (3) **Cleft soft palate**
 (4) **Cleft soft and hard palate** Intermaxillary
 Between palatine processes
 (5) **Cleft hard palate** Pre maxillary
 Between maxilla and pre maxilla
 (6) **Bipartite :** Between
 (a) Maxilla + palatine process
 & (b) Pre maxilla + maxilla + palatine process
 (7) **Bipartite with unilateral hare lip**
 (8) **Tripartite :** Between
 (a) Maxilla
 (b) Pre maxilla } Bilateral
 (c) Palatine processes
 (9) **Tripartite with bilateral hare lip**
- Degrees** (A) **Pre alveolar cleft** Hare lip
 (a) Incomplete or complete
 (b) Unilateral or bilateral
 (B) **Alveolar cleft** (Anterior)
 (a) Unilateral (α) Pre maxillary
 (β) Bipartite
 (b) Bilateral (α) Pre maxillary
 (β) Tripartite
 (C) **Post alveolar cleft** (Posterior)
 (a) Complete Uvula to alveolus
 (b) Incomplete Soft palate

(D) Total cleft :

- (a) Bipartite or tripartite cleft palate
- + (b) Unilateral or bilateral hare lip

Path Failure of union of

- (a) Globular process with maxillary process
- and/or (b) Maxillary process with its opposite fellow

Clinic (1) Nasal regurgitation

- (2) Indistinct and nasal phonation :
Inability to pronounce consonants
p, t, k, ch, s, j, z

(3) Deformity :

- (a) Hare lip If associated
- (b) Prominent pre maxilla
- (c) Defect in the palate soft and/or hard

Compl (1) Associated deformity imperforate anus
spina bifida
talipes, etc.

- (2) **Dysfunction :** (a) Phonation
(b) Deglutition

- (3) Tendency to respiratory complications

Treat Palatoplasty :

- Time** (1) Hare lip 4 to 8 weeks
- (2) Soft palate end of first year
- (3) Hard palate end of 2nd to 3rd year
(Before child learns to talk)

- Pre oper** (1) Oral hygiene
- (2) Respiratory prophylaxis
- (3) Choice of time
 - (a) Best general health
 - (b) Good weather

Tech (A) Brophy Wiring of maxillæ

Age 3 months

Seq Necrosis maxillæ

(B) Lane Muco periosteal flaps

Age 6 weeks to 12 weeks

Seq (a) Cicatrisation

(b) Immobility and shortening of soft palate

(C) Langenbeck or Dieffenbach—Warren :

Age 18 months to 30 months

Tech (1) Lateral tension relief incisions

(2) Paring the cleft edges

(3) Separation of muco periosteum

(4) Suture across the cleft

Seq Shortening and forward displacement of soft palate

- (c) Nose : (α) Deviation of the nose
 (β) Flat tip nose
 (γ) Flat nostril

(II) TRAUMA:

(1) SUBPERIOSTEAL HÆMATOMA

- Etio Boxers
 Site Lower jaw chin, angle
 Clinic (a) History
 (b) Tender local swelling adherent to bone
 Diff. diag (1) Fracture
 (2) New growth
 Compl (1) Ossification
 (2) Periostitis
- (2) FRACTURE JAW (See under Fractures)
 (3) DISLOCATION JAW (See under Dislocations)
 (4) DISPLACED MANDIBULAR CARTILAGE
 (See under Dislocations)

(III) INFECTIONS OF THE JAW :

(1) PERIOSTITIS

- Etio (a) Trauma
 (b) Sepsis
 Clinic Inflammatory swelling confined to one surface of the bone
 Compl (a) Superficial necrosis
 (b) Soft tissue infection
 Treat Incision and curettage

(2) ACUTE OSTEOMYELITIS JAW

(A) Upper jaw :

- Etio Infants
 Clinic (a) Puffiness of the face under the eyes
 ↓ (b) Abscess cheek
 ↓ (c) Sinus cheek

(B) Lower jaw :

- Etio Alveolar abscess
 Clinic (1) Diffuse œdematous inflammatory swelling
 (2) Painful trismus
 (3) Acute general toxæmia or septicæmia
 Diff diag (1) Acute cellulitis Ludwig's angina
 (2) Acute lymphadenitis
 (3) Acute parotitis
 Compl (1) Acute extensive necrosis
 (2) Cervical cellulitis → œdema glottis
 (3) Sinus thrombosis
 (4) Septic pneumonia
 (5) Septicæmia

(3) CHRONIC OSTEOMYELITIS AND NECROSIS OF THE JAW.

- Etiology** (1) Alveolar abscess **Dental sepsis**
 (2) Trauma **Compound fracture**
 (3) Acute osteomyelitis
 (4) Exanthemata
 (5) Syphilis and its treatment
 (6) Chemical phosphorus, mercury
 (7) **Cancrum oris**
 (8) Radium necrosis
 (9) Actinomycosis
- Clinic** (A) **Diffuse stage :**
 (a) Painful trismus
 (b) Tender œdematous diffuse swelling
 (c) General toxæmia
- (B) **Local stage :**
 Local subperiosteal → subcutaneous abscess
- (C) **Final stage :**
 Sinuses discharging pus
- Treat** (1) **Oral hygiene :**
 (a) Mouth washes
 (b) Laxatives
- + (2) **Antiseptic & antispecific**
- ↓ (3) **Sequestrotomy :**
 (a) From inside the mouth
 (b) From outside

(IV) TUMOURS OF THE JAW :

(A) INNOCENT TUMOURS

- (1) **Osteoma** - Ivory, cancellous
- (2) **Chondroma**
- (3) **Myxoma**
- (4) **Myeloma Osteoclastoma**
- (5) **Lipoma** subperiosteal
- (6) **Fibroma** periosteal

Clinic Pedunculated hard intrabuccal tumour

- (7) **Odontoma :** (See under Teeth)

(B) MALIGNANT TUMOURS

(1) **SARCOMA**

- (a) **Periosteal :**

Path Ossifying, very malignant

Clinic Rapidly growing diffuse tumour

Treat (α) **Excision**

(β) **Deep X Rays**

(b) Endosteal

Clinic Chronic osteomyelitis

Treat (a) Excision
(b) Deep X Rays

(c) Secondary sarcomatosis

Clinic Hard multiple cystic masses in the jaw
In general sarcomatosis

Treat Deep X Rays

(2) MELANOMA MALIGNUM

Path Spindle celled with melanin

Clinic Bluish black lump

Treat (a) Excision
(b) Radiotherapy

(3) CARCINOMA

Path (a) Squamous Extension from tongue or
floor of the mouth(b) Columnar From
(a) Periodontal membranes
(β) Air sinuses(c) Secondary To (1) Breast
(2) Bronchus
(3) Kidney
(4) Prostate
(5) Thyroid

(4) ENDOTHELIOMA

Malignant tumors of the upper jaw

(1) MAXILLARY PERIOSTEAL SARCOMA

Etiology Females of 45

Site Anterior surface

Clinic (1) Rapidly growing swelling
(2) DeformityDiff. diag (a) Antral empyema
(b) Bone cysts
(c) Leontiasis osseaTreat (A) Operative
(1) Preliminary ligation of external carotid
↓ (b) Excision of the maxilla
(B) Deep X Ray therapy

(2) Maxillary endosteal sarcoma

(3) Maxillary carcinoma

Clinic (1) Latent No symptoms and signs
↓ (2) Pseudo-sinusitic
(a) Nasal discharge
(b) Antral signs

↓ (3) **Tumour stage : With deformity**

(a) Central swelling, encroaching on .

- (1) Orbit
- (2) Nasal fossa
- (3) Palate
- (4) Cheek
- (5) Pterygoid fossa

(b) Pressure symptoms .

- (1) Nasal obstruction
- (2) Epiphora
- (3) Trigeminal neuralgia
- (4) Depressed palate

(4) **Ulcerating stage :** (a) Palate
(b) Cheek

Compl. (1) Hæmorrhage
(2) Hideous deformity
(3) Chest complications
(4) Neuralgia
(5) Cachexia

Treat : (a) Excision of the maxilla
(b) Radiotherapy

(V) **OTHER DISEASES OF THE JAW :**

(1) **LEONTIASIS OSSEA .**

Path. Creeping periostitic hyperostosis of both the jaws .
. Due to some infective focus

Clinic. (a) Hideous deformity, especially of upper face
(b) Pressure symptoms

(2) **OSTEITIS DEFORMANS :** (See under Bones)

Clinic : Porosity and cystic enlargement of the mandible

(3) **OSTEITIS FIBROSA** (See under Bones)

(4) **ACROMEGALY**

Etio : Hypertrophic and hyperactive anterior pituitary

Clinic : (1) Prognathous lower jaw
(2) Other signs of acromegaly .
: (See under Pituitary Gland)

(D) **THE PALATE**

(I) **CONGENITAL AFFECTIONS :**

Cleft palate. (See above)

(II) **TRAUMA :**

: Penetrating injuries

Etio : Fall on projecting objects with open mouth

(III) PERFORATIONS OF THE PALATE:

- (1) **Post-operative perforation:**
: After palatoplasty for congenital cleft
- (2) Traumatic
- (3) **Syphilis:** Gumma of the palate
- (4) **Malignant:** (a) Carcinoma
(b) Rodent ulcer
- (5) Tuberculous: lupus

(IV) TUMOURS OF THE PALATE:

- (1) Mixed tumours
- (2) Hæmangioma.

Diff. diag: From peritonsillar abscess

- (3) Adenoma and adeno carcinoma
- (4) Osteoma: torus palatinus
- (5) **Carcinoma:**
(a) Ulcerating tumour
(b) Raised infiltrating plaque

(E) OPERATIONS ON THE JAW**(1) EXCISION OF THE LOWER JAW:**

- Ind (1) Epulis
(2) Odontome
(3) Malignancy
(4) Extensive necrosis

Pre-oper: Oral hygiene

- Anæsth (a) Intratracheal with pharyngeal plugging
(b) Regional
(a) Mandibular division of trigeminal
+ (3) Midpoint of posterior border of sternomastoid

- Tech (1) Incision (a) Centre of the lower lip
↓ (b) Symphysis menti
↓ (c) Along the lower border of mandible
↓ (d) Angle of the mandible
↓ (e) Lobule of the ear
(2) Ligature of facial vessels
(3) Isolation of jaw from soft tissues
(4) Extraction of the incisors
(5) Division of the jaw to one side of midline
(6) Division of internal attachments
(a) Inferior dental vessels
(b) Temporal and external pterygoid tendons
(c) Capsule of the temporo-mandibular joint

- Save. (1) Facial nerve
(2) Internal maxillary vessels
(3) Oral cavity and pharynx

(2) EXCISION OF THE UPPER JAW:

Ind: Malignancy

- Pre-oper: (1) Oral hygiene
(2) Preliminary ligature of external carotid

- Anæsth (a) Intratracheal with pharyngeal plug
 (b) Regional (α) Trigeminal ganglion
 or (β) Maxillary nerve
- Tech (1) Incision (a) Malar region
 ↓ (b) Lower eyelid
 ↓ (c) Nasal attachment
 ↓ (d) Columella
 ↓ (e) Philtrum
 ↓ (f) Centre of the upper lip
- (2) Outward reflection of the soft tissue flap
 (3) Elevation of periosteum of the orbital floor
 (4) Division of bone
 (a) Maxillo malar junction
 (b) Nasal process of maxilla
 (5) Intra buccal manœuvres
 (a) Extraction upper incisor
 (b) Incision centre of the hard palate
 (c) Detachment of soft from hard palate
 (6) Naso buccal manœuvres
 Section of alveolus and hard palate
 (7) Detachment of maxilla
 (8) Closure

After treatment of excision jaw

- (1) Propped up posture
 (2) Oral hygiene sprays, syringes, gargles
 (3) Respiratory precautions

Complications of excision jaw

- (1) Shock
 (2) Haemorrhage
 (3) Asphyxia
 (4) Lung complications Aspiration pneumonia
 (5) Local sepsis

Sequelæ (1) Deformity

- Treat (a) Obturator maxilla
 (b) Bone graft mandible
- (2) Epiphora maxilla
 (3) Facial paralysis
 (4) Fistulæ
 (5) Recurrence of malignancy

(F) THE MOUTH CAVITY

(I) CONGENITAL AFFECTIONS:

- (1) CLEFT PALATE (See under Jaws)
 (2) TONGUE AFFECTIONS (See under Tongue)

(II) INFLAMMATIONS OF THE MOUTH:

- (1) STOMATITIS

Etio varieties (A) Primary:

- (a) Non specific: Septic catarrhal
- (b) Specific: Syphilis

(B) Secondary:

- (a) General anaemia, sprue
- (b) Local around
 - (a) Stensen's duct
 - (b) Wharton's duct
 - (c) Septic tooth

Path varieties (A) Catarrhal:

- Etio** (1) Oral sepsis
- (2) Alimentary sepsis
- (3) Abdominal and buccal operations
- Causes** (1) Oral dehydration
- (2) Oral and alimentary stagnation
- (3) Oral sepsis
- Clinic** Raw tongue and buccal muc mem
- Compl** (1) Parotitis
- (2) Cancrum oris
- Treat** (a) Antiseptic gargles and applications
- (b) Lemon to suck
- (c) Laxatives

(B) Aphthous:

- Etio** Oidium albicans fungus sour milk
- Clinic** (a) Infants
- (b) Yellow spotted stomatitis

(C) Vincent's: Trench mouth

- Etio** Vincent's spirillum
- Clinic** (a) Adults
- (b) Grey spotted stomatitis

(D) Ulcerative

- Etio** (a) Syphilis
- (b) Mercury
- Clinic** Stomatitis with multiple ulcers

(E) Gangrenous:

- Etio** (a) Cancrum oris
- (b) Acute infections

Treat (1) Oral hygiene:

- (A) Flushing Lemon to suck
- (B) Cleansing

Sprays } Condys
 Syringing } Hydrogen peroxide
 Gargles } Listerine

- (C) Applications antiseptic, emollient

- Post. compl: (1) Injury to Wharton
 (2) Ankyloglossia
 (3) Recurrence

(B) Deep or plunging:

- Clinic. (a) Simple sublingual ranula
 + (b) Submental projection

Treat: Cervical excision

(3) SUBLINGUAL DERMOID.

Origin. Mesobranchial field of H1s

Clinic. Big, thin walled, opaque, midline, sublingual cyst projecting into the mouth and in the neck, and containing sebaceous material

Treat Cervical excision

(4) INTRA ORAL THYROGLOSSAL CYST:

Path. Remnant of thyroglossal duct

Site. Below the posterior third of the tongue

Clinic. Deep cystic swelling below the base of the tongue containing glairy fluid

(IV) INTRABUCCAL TUMOURS:

(1) HÆMANGIOMA

- Sites. (1) Cheek
 (2) Floor of the mouth
 (3) Tongue

Compl: Hæmorrhage

(2) PAPILLOMA

- Sites: (1) Cheek
 (2) Gums
 (3) Tongue
 (4) Lips

Clinic. Warty projection over the mucous membrane

Diff. diag (a) Septic proud granulations:
 Granulomatous epulis
 (b) Carcinoma

Compl: Carcinoma

Treat: Excision

(3) MIXED MOLAR TUMOURS:

Sites. Palate, cheek

Path: Same as mixed salivary tumours

(4) SUCKING PAD LIPOMA:

Site: Between the masseter and the buccinator

Path: Lipoma

(5) CARCINOMA:

Etiol. (a) Syphilis

(b) Plumer-Vinson syndrome :

: Dysphagia and achlorhydric anæmia with buccal mucous atrophy in women between 15 and 40

(c) Betel-nut and tobacco**(d) Septic tooth****(e) Papilloma**

- Sites :** (1) Lateral margin of the tongue : septic tooth
 (2) Floor of the mouth : extension from tongue
 (3) Labio-alveolar sulcus : betel nut
 (4) Roof of the mouth : hard or soft palate
 (5) Cheek :

Etio : Leukoplakia : 70%

Path : (1) Epithelioma . 90%

(2) Adeno carcinoma

Clinic (1) Warty

(2) Ulcerative

(3) Latent :

: Biopsy of a seemingly innocent tumour

Treat : (A) Primary :

(1) Surgical excision : (a) Knife

(b) Cautery

or (2) Irradiation

(B) Secondary glandular metastases :

(1) Surgical excision

or (2) Irradiation

(C) Preliminary or palliative :

. Alcohol injection of trigeminal

(V) ORAL DIFFUSE SUBMUCOUS FIBROSIS:

Etio : Young anæmic adults

Clinic : Trismus

Treat . (A) Local open with mouth gag under anæsth.

(B) General . treat the anæmia

(G) THE TONGUE**(1) CONGENITAL MALFORMATIONS :**

(1) Total absence

(2) Bifid tongue

(3) Ankyloglossia . (a) Superior

(b) Inferior

(4) Mobile tongue

(5) TONGUE-TIE :

Def : Inability to protrude the tongue
 line of the teeth

Clinic : (1) Speech abnormality

(2) Non-protrusion of the tongue

Treat: Frænum nicked near the jaw

- Post. compl: (a) Hæmorrhage
 (b) Injury to Wharton's duct
 (c) Chronic ulcer
 (d) Cicatrisation: Ankyloglossia
 (e) Macroglossia

(6) LINGUAL THYROID:

Path: Remnant thyroid tissue at the lingual base

Clinic: Rounded vascular tumour at the lingual base

- Compl: (a) Dysphagia
 (b) Dyspnœa
 (c) Hæmorrhage

Treat: Leave it alone

- Post-compl: (a) Hæmorrhage
 (b) Myxœdema

(II) TRAUMA:

(1) WOUNDS:

Etio: Bites, falls

- Pre-disp: (a) Anæsthesia
 (b) Epilepsy
 (c) Paralysis

- Compl: (1) Hæmorrhage
 (2) Retention of foreign body
 (3) Abscess

(2) HÆMORRHAGE:

Causes: (a) Primary: Traumatic
 : Operative

- (b) Secondary: Sepsis
 : Hæmangioma
 : Malignancy

Treat: (1) Apical stitch traction

↓ (2) Heath: Base of the tongue with hyoid hooked forwards by the fore-finger

↓ (3) Undermining sutures

↓ (4) Ligature of lingual or ext. carotid artery:

- Ind: (a) Preliminary to operations
 (b) Uncontrollable secondary hæmorrhage

(3) BURNS AND SCALDS:

- Etio: (1) Hot fluids
 (2) Corrosive poisons

- Compl: (a) Acute glossitis
 (b) Œdema glottis
 (c) Pneumonia

- Sequelæ: (1) Ankyloglossia
 (2) Chronic ulceration → epithelioma

(III) INFLAMMATIONS:

(A) ACUTE GLOSSITIS:

(1) ACUTE SUPERFICIAL GLOSSITIS:

Etio : Burns, injuries

Path: (a) Local: Traumatic

(b) **Diffuse:**

(a) Nervous, herpetic

(β) Membranous: diphtheritic

(γ) Pellicular: smokers

Treat: (1) Local: (a) Soda bi carb 30 gr. to dr. 1

(b) Zinc sulphate 2 gr. to oz. 1

(2) Internal: Pot. chloras

(3) Specific : Sera

(2) ACUTE PARENCHYMATOUS GLOSSITIS:

Etiology: (1) Septic mouth

(2) **Mercury**

(3) Ludwig's angina

Clinic: (1) Œdematous, swollen, furred tongue

(2) Local and reflex pain

(3) Profuse salivation

(4) " " " (ial)

(5)

1

+ (b) Floor of the mouth

(6) Cervical lymphadenitis

(7) Acute toxæmia

Compl: (a) Abscess

(b) Gangrene

(c) **Œdema glottis**

(d) Aspiration pneumonia

Treat: (1) Expectant: (a) Gargles, ice, leeches

(b) Purges

(2) Operative:

Ind: Persistent or severe swelling

Tech. Free incisions :

: Into the dorsum

: 2nd inch on either side of midline

: $\frac{1}{3}$ rd inch deep

(3) BASAL GLOSSITIS.

Etiol. Predisposers: (a) Anæmia

(b) **Constant use of voice**

Exciting: Inhaled irritation

Path: Lingual tonsillitis

Clinic: Congested and swollen lingual base

Compl: Abscess

- Treat (a) Mercurial purge
 (b) Pot. chlorate gargles
 (c) Quinine salicylate
- (4) **ABSCESS OF THE TONGUE**
 Etio (a) Trauma
 (b) Acute parenchymatous glossitis
 (c) Basal glossitis
 Clinic Local inflammatory induration with no fluctuation
 Treat Incision → evacuation → gargles
- (5) **GANGRENE OF THE TONGUE**
 Etio (1) Acute parenchymatous glossitis
 (2) Syphilis and mercury
 (3) Cancerum oris
 (4) Ligation of both lingual arteries

(B) CHRONIC GLOSSITIS

(1) LOCAL INDURATIVE GLOSSITIS

- Etio (1) Septic tooth
 (2) Wharton's duct calculus
 Clinic Chronic local glossitis around a focus
 Compl (a) Ankyloglossia
 (b) Carcinoma
 Treat Treat the primary focus

(2) DYSPEPTIC TONGUE

- Etio (a) Dyspepsia with constipation
 (b) Idiosyncrasy to certain foods
 Clinic Raw, beefy, excoriated tongue
 With dyspeptic painful ulcers
 Treat (a) Antiseptic gargles
 (b) Chromic acid (10 grs to oz 1) paint
 (c) Laxatives and intestinal antiseptics

(3) LEUKOPLAKIA Chronic superficial glossitis

- Def (1) Chronic superficial glossitis with
 (a) Patchy heaps of keratinised epith
 (b) Atrophy of lingual papillæ
 (c) Chronic inflam. of subjacent dermis
 (2) An intractable form of chronic hyperplasia with a definite tendency towards cancerous change

Etio Sex Males

Age After 30

Pre-disposers 'Six Ss': Syphilis, sepsis, sharp tooth
 Smoking, spices, spirits

- Treat (a) Mercurial purge
 (b) Pot. chlorate gargles
 (c) Quinine salicylate

(4) ABSCESS OF THE TONGUE

- Etio (a) Trauma
 (b) Acute parenchymatous glossitis
 (c) Basal glossitis

Clinic Local inflammatory induration with no fluctuation

Treat Incision → evacuation → gargles

(5) GANGRENE OF THE TONGUE

- Etio (1) Acute parenchymatous glossitis
 (2) Syphilis and mercury
 (3) Cancrum oris
 (4) Ligature of both lingual arteries

(B) CHRONIC GLOSSITIS

(1) LOCAL INDURATIVE GLOSSITIS.

- Etio (1) Septic tooth
 (2) Wharton's duct calculus

Clinic Chronic local glossitis around a focus

- Compl (a) Ankyloglossia
 (b) Carcinoma

Treat Treat the primary focus

(2) DYSPEPTIC TONGUE

- Etio (a) Dyspepsia with constipation
 (b) Idiosyncrasy to certain foods

Clinic Raw, beefy, excoriated tongue
 With dyspeptic painful ulcers

- Treat (a) Antiseptic gargles
 (b) Chromic acid (10 grs to oz 1) paint
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 (2) An intractable form of chronic hyperplasia with a definite tendency towards cancerous change

Etio Sex Males

Age After 30

Pre-disposers 'Six S's': Syphilis, sepsis, sharp tooth
 Smoking, spices, spirits

Path: Chronic inflammatory hyperplasia of the superficial tissues of the tongue :

- (1) Hyperplastic and keratinised epith.
- (2) Atrophy of papillæ
- (3) Lymphocytic infiltration of the dermis
- (4) Vacuolisation of Malpighian layer cells

Clinic: Stage (1): Enlarged papillæ

Stage (2): Butlin's 'white paint' tongue

Stage (3): Red glazed tongue

**Stage (4): Cracks', fissures, ulcers and warts
: Leukoplakic patches :**

(a) Network type

(b) White type

(c) Warty type

Compl: Carcinoma

Treat: (A) Conservative :

(a) Pot. chlor gargles

(b) Chromic acid paints (dangerous)

(c) White vaseline smears

(B) Operative: Butlin's operation :

Excision of affected mucous
membrane of the tongue

(C) Radium

(D) Contact X Ray therapy

(4) ERYTHEMA MIGRANS:

Syn: Geographical tongue

Etio: Debilitated children

**Clinic: Enlarging patches of smooth red areas with
a life history of seven days.**

Treat: (1) Astringent mouth washes

(2) Tonics

(5) GLOSSODYNIA EXFOLIATIVA

**: Neuralgia of lingual nerve associated with thinning
of the epithelium**

(6) FURROWS OF THE TONGUE :

Varieties: (A) Natural: longitudinal

(B) Acquired. transverse

Etio: Chronic inflammation

Compl: Carcinoma

Treat: (a) Antiseptic mouth washes

(b) Chromic acid paints

(c) Ointments

(IV) ULCERS OF THE TONGUE:

(1) SIMPLE ULCER:

Etio: Chronic superficial glossitis

- Treat (a) Mercurial purge
 (b) Pot. chlorate gargles
 (c) Quinine salicylate

(4) **ABSCESS OF THE TONGUE**

- Etio (a) Trauma
 (b) Acute parenchymatous glossitis
 (c) Basal glossitis

Clinic Local inflammatory induration with no fluctuation

Treat Incision → evacuation → gargles

(5) **GANGRENE OF THE TONGUE**

- Etio (1) Acute parenchymatous glossitis
 (2) Syphilis and mercury
 (3) Cancrum oris
 (4) Ligature of both lingual arteries

(B) **CHRONIC GLOSSITIS**

(1) **LOCAL INDURATIVE GLOSSITIS**

- Etio (1) Septic tooth
 (2) Wharton's duct calculus

Clinic Chronic local glossitis around a focus

- Compl (a) Ankyloglossia
 (b) Carcinoma

Treat Treat the primary focus

(2) **DYSPEPTIC TONGUE**

- Etio (a) Dyspepsia with constipation
 (b) Idiosyncrasy to certain foods

Clinic Raw, beefy, excoriated tongue
 With dyspeptic painful ulcers

- Treat (a) Antiseptic gargles
 (b) Chromic acid (10 grs to oz 1) paint
 (c) Laxatives and intestinal antiseptics

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- Def (1) Chronic superficial glossitis with
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 (b) Atrophy of lingual papillæ
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Age After 30

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 Smoking, spices, spirits

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Clinic : Stage (1) : Enlarged papillae

Stage (2) : Butlin's 'white paint' tongue

Stage (3) : Red glazed tongue

Stage (4) : Cracks', fissures, ulcers and warts
: Leukoplakic patches :

(a) Network type

(b) White type

(c) Warty type

Compl : Carcinoma

Treat : (A) Conservative :

(a) Pot. chlor. gargles

(b) Chromic acid paints : (dangerous)

(c) White vaseline smears

(B) Operative : **Butlin's operation :**

: Excision of affected mucous membrane of the tongue

(C) Radium

(D) Contact X Ray therapy

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Syn : Geographical tongue

Etio : Debilitated children

Clinic : Enlarging patches of smooth red areas with a life history of seven days.

Treat . (1) Astringent mouth washes

(2) Tonics

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: Neuralgia of lingual nerve associated with thinning of the epithelium

(6) FURROWS OF THE TONGUE :

Varieties : (A) Natural : longitudinal

(B) Acquired . transverse

Etio : Chronic inflammation

Compl : Carcinoma

Treat : (a) Antiseptic mouth washes

(b) Chromic acid paints

(c) Ointments

(IV) ULCERS OF THE TONGUE :

(1) SIMPLE ULCER.

Etio . Chronic superficial glossitis

Site: Central

Clinic: Fissured or stellate

Treat: (A) Local applications:

(a) Chromic acid: 5-10 grs. per ounce

(b) Salicylic acid: 2 grs. per ounce

(c) Lactic acid: 5 grs. per ounce

(B) Excision

(2) DYSPEPTIC ULCER:

Etio: (a) Chronic dyspepsia

(b) Anæmia

(c) Idiosyncrasy: to certain articles of food

Site. (a) Apex of the tongue; (b) lips, (c) gums

Clinic: Painful, small, circular, punched out, multiple
ulcers with red areola

Treat. (a) Antiseptic mouth washes

(b) Silver nitrate applications

(c) Anti-dyspeptic and laxative treatment

(3) TRAUMATIC OR DENTAL ULCER:

Etio: (a) Bad tooth, denture

(b) Œdematous tongue

Site. Lateral margin

Clinic. Chronic, painful, indurated, œdematous, sloughy

Diff diag. Carcinoma

Compl. Carcinoma

Treat. (a) Extraction of offending tooth

(b) Oral antiseptics

(c) Excision and biopsy

(4) SYPHILITIC ULCER.

(A) Primary chancre:

Clinic: (1) Indolent indurative apical lesion

(2) Acute œdematous lymphadenitis

(B) Secondary ulcers:

Clinic. Multiple, shallow, snail-track ulcers on the sides
and under surface of the tongue

(C) Gummatous ulcers:

Site. Central

Clinic. Single, painless, indurative

Treat: (*Of syphilitic ulcers of the tongue*)

(a) Mouth hygiene

(b) Anti syphilitic

(5) MERCURIAL ULCER:

Clinic. (a) History of mercurial intake

(b) Multiple, shallow, irregular ulcers

(c) Parenchymatous glossitis

(d) Spongy gums with loose teeth

- Treat (1) Antiseptic mouth washes
 (2) Pot chlorate internally
 (3) No pot iodide

(6) TUBERCULOUS ULCER

- Etiology (a) Primary rare
 (b) Secondary to (1) Late phthisis
 (c) T B larynx

Site Lateral

- Clinic (1) Soft shallow yellowish circular multiple very painful
 (2) Phthisis

- Treat (a) Lactic acid 50% paint
 (b) Orthoform dusting

(7) CARCINOMATOUS ULCER

Etiology **Chronic irritation** Mechanical or septic

- Path (1) **Ulcerative carcinoma**
 (a) Primary malignant ulcer
 (b) Malignant degeneration of simple ulcer
 (2) **Ulcerating carcinoma**
 Carcinoma with secondary ulceration

Site Lateral border

- Clinic (a) History of irritative focus bad tooth
 (b) **Induration** Of base
 (c) Eversion of margin
 (d) Friability of surface
 (e) Ankyloglossia

- Clinical types (1) **Classical type** malignant ulcer
 (2) **Doubtful type** chronic ulcer
 (3) **Latent type** Diagnosed by biopsy only

- Sp sign **Biopsy** Excise
 (1) **Apparently normal surroundings**
 + (b) **Clinical margin**
 + (c) **Affected tissue**

(8) FRÆNAL ULCER

- Etiology (a) Operation for tongue tie
 (b) Whooping cough
 (c) Sepsis around Wharton's duct orifice

(9) HERPETIC ULCER

- Clinic (a) Crops of 1 near vesicles → small ulcers
 (b) Lingual neuralgia

(V) SPECIFIC DISEASES OF THE TONGUE

(1) SYPHILIS OF THE TONGUE

(A) **Primary chancre**

- Clinic (a) Hard indolent indurated
 (α) Nodule
 (β) Ulcer
 (γ) Fissure

+ (b) Acute oedematous indurative lymphadenitis

(B) Secondary lesions :

- Clinic (a) Snail track ulcers
 (b) Mucous patches and nodules
 (c) Hutchinson's median wart

(C) Tertiary lesions :

- Clinic (1) General lesions
 (a) Chronic superficial glossitis
 (b) Chronic parenchymatous glossitis
 (c) Macroglossia
 (d) Fibrosed atrophic tongue
- (2) Local lesions
 (a) Leukoplakia
 (b) Fissures
 (c) Ulcers
 (d) Gummata (a) Superficial
 (β) Deep

- Clinic (1) Central painless induration
 ↓ (2) Central painless ulcer

- Diagnosis (*Of syphilitic lesion of the tongue*)
 (a) Association with other stigmata
 (b) Wassermann or Kahn
 (c) Relative painlessness
 (d) Reaction to treatment

(?) TUBERCULOSIS OF THE TONGUE

- Clinic (a) Nodes
 (b) Fissures
 No associated phthisis
 (c) Ulcers
 (a) Soft shallow yellowish, circular
 (β) Associated phthisis
 (d) Lupus
- Diagnosis (1) Very painful lesions
 (2) Associated phthisis
- Treat (a) Lactic acid 50% paint
 (b) Orthoform dusting
 (c) Anti tuberculous

(VI) MACROGLOSSIA :

- Def Enlargement of the tongue
- Varieties (A) **Inflammatory** • Acute parenchymatous glossitis
 Etio (1) Sepsis
 (2) Mercury
- Clinic Acutely inflamed oedematous tongue
- Compl (1) Oedema glottis
 (2) Pneumonia
- (B) **Syphilitic** • Early parenchymatous glossitis
- (C) **Mercurial** • (See above)

(D) Muscular :

Etio : Cretins and idiots

Path : Muscular hypertrophy

Compl : Dental ulcer

(E) Lymphangiomatous :

Clinic. (1) Diffuse enlargement of the tongue

(2) Minute surface vesicles

(3) Lymphorrhœa

Compl : Recurrent inflammatory attacks

(VII) TUMOURS OF THE TONGUE :**(A) INNOCENT TUMOURS .****(1) HÆMANGIOMA**

Path varieties (a) Arterio venous aneurysm

(b) Cirsoid aneurysm

(c) Cavernous nævus

(d) Capillary nævus

Clinic Bleeding vascular growth

Compl : Hæmorrhage

Treat. (a) Diathermy large superficial growths

(b) Excision small nævi

(c) Radon seeds

(2) PAPILLOMA :

Etio (a) Congenital

(b) Chronic inflammatory

(c) Leukoplakic

Clinic : (1) Warty growth

(2) No basal induration

Sign Biopsy

Diff. diag. Carcinoma

Compl Malignancy

Treat (1) Excision : (a) Surgical

(b) Cautery :

(a) Sharp

(b) Coagulation

(2) Radium

(3) Contact X-Ray therapy

(3) LYMPHANGIOMA (See under Macroglossia)**(B) MALIGNANT TUMOURS :****(1) SARCOMA****(2) CARCINOMA TONGUE .**

Etio : Men between 40 and 60

Pre disp : Chronic irritation and inflammation

'Seven Ss' : (1) Spices

(2) Smoking

(3) Spirits

(4) Silver nitrate : (caustic)

- (5) Sepsis
- (6) Sharp tooth
- (7) Syphilis

Pre-cancers: (1) Chronic superficial glossitis:

- (a) Hypertrophic
- (b) Atrophic

(2) Chronic local foci:

- (a) Leukoplakia
- (b) Fissures
- (c) Ulcers
- (d) Warts
- (e) Granulomata

(3) Benign tumours:

- Papillomata

Site: (1) Ant. two-thirds of the lateral borders

(2) Base

(3) Apex

(4) Under aspect—('Hidden' carcinoma)

Path: (A) Primary:

- (a) Squamous celled
- (b) Prickle or basal celled
- (c) Lympho epithelioma

(B) Secondaries:

(1) Lymphatics:

- (a) Apical set: Bilateral
- (b) Lateral set: Unilateral
- (c) Median set: Bilateral
- (d) Basal set: Bilateral

(2) Lymph glands:

- (a) Submental
- ↓ (b) Submaxillary
- ↓ (c) Superior deep cervical
- ↓ (d) Inferior deep cervical

(3) Bones

(4) Skin

(5) Viscera

} Rare (in radium treated cases)

Clinic: (A) Early: (1) Tumour or ulcer:

: indurated, friable

(2) Pain: local or referred

(3) Ankyloglossia

(B) Late: (4) Salivation

(5) Dysphagia

(6) Dysphonia

(7) Faecal of breath

(8) Haemorrhage

(9) Lump in the neck

Clinical types . (A) Local :

(1) Centrifugal :

- (a) Papillary warty
- (b) Fungating cauliflower
- (c) Nodular

(2) Centripetal :

- (a) Ulcerous
- (b) Fissured

(B) Referred

- (1) Neck tumour
- (2) Referred pain

Diff diag (1) Syphilis (a) Chancre
 (b) Gumma
 (a) Local
 (β) Infiltrating

(2) Dental ulcer

- (3) Leukoplakia
- (4) Papilloma

Sp sign Biopsy

Course Death within one year due to

- (1) Aspiration pneumonia
- (2) Cancerous and starvation cachexia
- (3) Secondary hæmorrhage
- (4) Asphyxia œdema glottis
- (5) Metastases

Prognosis Better in centrifugals than in centripetals

Treat (A) Primary growth .

(1) Radium :

- Ind (a) Base of the tongue
 (b) Fungating growth
 (c) Non involvement of bone

Tech Interstitial needling

Compl Necrosis jaw

- (2) Low voltage contact X Ray therapy
- (3) Diathermy excision
 - (a) Coagulation
 - (b) Cutting

(4) Surgical excision :

- Ind (a) Radium not available
 (b) Tip carcinoma
 (c) Invasion of the bone
 (d) Good general condition

Pre treat . (1) Estimation of operability
 (2) Estimation of general health

- (5) Sepsis
 (6) Sharp tooth
 (7) Syphilis
- Pre cancers**
- (1) Chronic superficial glossitis
 - (a) Hypertrophic
 - (b) Atrophic
 - (2) Chronic local foci :
 - (a) Leukoplakia
 - (b) Fissures
 - (c) Ulcers
 - (d) Warts
 - (e) Granulomata
 - (3) Benign tumours
 Papillomata
- Site**
- (1) Ant. two thirds of the lateral borders
 - (2) Base
 - (3) Apex
 - (4) Under aspect—(' Hidden ' carcinoma)
- Path**
- (A) Primary :
- (a) Squamous celled
 - (b) Prickle or basal celled
 - (c) Lympho epithelioma
- (B) Secondaries :
- (1) Lymphatics :
 - (a) Apical set Bilateral
 - (b) Lateral set Unilateral
 - (c) Median set Bilateral
 - (d) Basal set Bilateral
 - (2) Lymph glands :
 - (a) Submental
 - ↓ (b) Submaxillary
 - ↓ (c) Superior deep cervical
 - ↓ (d) Inferior deep cervical
 - (3) Bones
 - (4) Skin
 - (5) Viscera
- } Rare (in radium treated cases)
- Clinic**
- (A) Early
- (1) Tumour or ulcer :
 : indurated, friable
 - (2) Pain local or referred
 - (3) Ankyloglossia
- (B) Late
- (4) Salivation
 - (5) Dysphagia
 - (6) Dysphonia
 - (7) Faecal of breath
 - (8) Hæmorrhage
 - (9) Lump in the neck

Clinical types : (A) **Local :**

(1) **Centrifugal :**

- (a) Papillary : warty
- (b) Fungating : cauliflower
- (c) Nodular

(2) **Centripetal :**

- (a) Ulcerous
- (b) Fissured

(B) **Referred :**

- (1) Neck tumour
- (2) Referred pain

Diff. diag : (1) Syphilis : (a) Chancre
(b) Gumma :
(a) Local
(b) Infiltrating

(2) Dental ulcer

(3) Leukoplakia

(4) Papilloma

Sp sign. **Biopsy**

Course. Death within one year due to

- (1) Aspiration pneumonia
- (2) Cancerous and starvation cachexia
- (3) Secondary hæmorrhage
- (4) Asphyxia : œdema glottis
- (5) Metastases

Prognosis : Better in centrifugals than in centripetals

Treat : (A) **Primary growth :**

(1) **Radium :**

- Ind : (a) Base of the tongue
- (b) Fungating growth
- (c) Non involvement of bone

Tech : *Interstitial needling*

Compl Necrosis jaw

(2) Low voltage contact X-Ray therapy

(3) Diathermy excision :

- (a) Coagulation
- (b) Cutting

(4) **Surgical excision :**

- Ind : (a) Radium not available
- (b) Tip carcinoma
- (c) Invasion of the bone
- (d) Good general condition

Pre-treat. (1) Estimation of operability
(2) Estimation of general health ..

- (3) **Oral antisepsis**
- (4) **Respiratory precautions**
- (5) **Blood transfusion**
- Pre procedures (a) **Cervical block dissection**
+ **Ligature of lingual art**
- (b) **Laryngotomy**
With pharyngeal plug
- Procedures (1) **Local excision :**
With healthy surroundings
- (2) **Wedge resection :**
Of the tongue
- (3) **Hemisection :**
Of anterior tongue
- (4) **Total resection :**
Of anterior tongue
(a) **Tongue alone**
(b) **With adherent bone**
- (5) **Complete excision :**
Of the tongue
- Exposures (1) **Whitehead . Intrabuccal**
- (2) **Kocher Submaxillary**
- (3) **Regnoli Submental**
- (4) **Langenbeck Cheek split**
- (5) **Syme Midline jaw cut**
- (6) **Lateral division of jaw**
- Techniques (A) **Buccal excision of primary**
↓ **Cervical glandular excision**
or (B) **Cervical glandular excision**
+ **Lingual arterial ligation**
↓ **Buccal excision of primary**
- Post treat (1) **Prop up posture**
- (2) **Mouth gargles and syringing**
- (3) **Anti pneumonic treatment**
- (B) **Secondary cervical glands :**
- (1) **Very early impalpable glands :**
- Treat (a) **Deep X Ray therapy**
With close after watch
- (b) **Treat the primary**
- (2) **Operable glands :**
- Ind (a) **Primary treated or treatable**
- (b) **Local operability**
- (c) **General operability**
- Tech (1) **Unilateral block dissection**
- (2) **Bilateral block dissection :**
- Ind (a) **Apical primary**
- (b) **Median primary**
- (c) **Basal primary**

Tech : Two stage :
: Interval of 2/3 weeks.

Sequence : (1) **Preliminary :**
: To 'primary' treatment :
(a) *With lingual art. ligat.*
(b) Without ligature

(2) **Secondary :**
: To 'primary' treatment

(3) **Inoperable glands :**

Ind : (a) Wide skin involvement
(b) Adhesions to :
(a) Carotid artery
(β) Prevertebral fascia
(γ) Bone
(c) Implication of inf cervicals
(d) Untreatable primary

Treat. (1) **Deep X-Ray therapy**
(2) **Radium**

Post. oper. compl. (1) **Shock**
(2) **Hæmorrhage :** (a) **Primary**
(b) **Secondary**
: Beware of blood-stained saliva
on 5th or 6th day.

(3) **Pulmonary :**
(a) **Aspiration pneumonia**
(b) **Abscess or gangrene lung**
(c) **Empyema**
(4) **Cervical cellulitis**
(5) **Œdema glottis**
(6) **Osteomyelitis jaw**
(7) **Recurrence**
(8) **Exhaustion :** Inanition
: Cachexia

(IX) IMPORTANT POINTS

(A) The teeth :

- (1) Painful trismus in adolescents : ? Third molar trouble
- (2) *Impacted and infected third molar is the most common cause of :* (a) *Trismus*
(b) *Alveolar abscess*
(c) *Osteomyelitis jaw.*
- (3) Third molar should never be extracted when sepsis under the capuchon is fulminating, try conservative measures unless there is apical abscess.

- (4) Re implantation of a recently knocked out or extracted tooth is sometimes successful. Healthy mouth, clean unfractured tooth and young age are essentials for success.
- (5) *Most common causes of alveolar sepsis*
 - (a) *Dental caries*
 - (b) *Pyorrhæa alveolaris*
- (6) *Stuffing of a badly carious tooth carries a risk of peri dental sepsis and its sequelæ*
- (7) *In cases of acute apical abscess, the most effective treatment is immediate extraction of tooth*
- (8) *An alveolar abscess should never be fomented and, as far as possible, not opened from outside, as inevitable discharging sinus on the face results*
- (9) *Chronic root abscess is one of the noted primary septic foci in the body leading to unexplained and distant signs of toxæmia pyæmia or dyspepsia*
- (10) *Continued stagnation of food particles in the mouth leads to fermentation and the putrefaction leads to carious decalcification of the tooth enamel and to chronic inflammation of gum margins*
- (11) *Pyorrhæa alveolaris must always be treated in every kind of chronic dyspepsias toxæmias and anæmias, and before every operation on the oral cavity and digestive tract*
- (12) \ Ray picture in odontomes
 - (i) Cavity at the root of a normal tooth
? Dental cyst
 - (b) Cavity containing a non erupted tooth
? Dentigerous cyst
 - (c) Multilocular central expansion
? Multilocular cystic disease
? Myeloma.
- (13) *Never place the forceps between the roots in extraction of upper or lower teeth*
- (14) *Upper first premolar is the most difficult tooth to extract and one most liable to break*
- (15) *In extraction of the teeth*
 - (a) *For upper teeth straight forceps*
 - (b) *For lower teeth hawk bill forceps*
- (16) *Severe or continued hæmorrhage after tooth extraction is a common emergency*

(B) **Jaw :**

- (17) *Acute complications of acute osteomyelitis jaw*
 - (a) *Septicæmia*

- (b) *Pneumonia*
 (c) *Cervical cellulitis and its sequelæ*
- (18) *Septic tooth is the most common cause of jaw sepsis*
- (19) *In chronic osteomyelitis of the jaw*
 (a) *Involucrum formation is very poor*
 (b) *Separation of sequestrum is very slow*
- (20) *Radium necrosis is the most chronic and most painful form of necrosis of lower jaw*
- (21) *Most common new growths of the jaw*
 (A) Maxilla (a) *Sarcoma* (α) *Parlate*
 (b) *Carcinoma* (β) *Higmore*
 (B) Mandible (a) *Extension carcinoma*
 (b) *Epulides*
 (c) *Odontoma*
- (22) *Common complications of jaw operations*
 (1) *Shock*
 (2) *Hæmorrhage primary or secondary*
 (3) *Lung affections*
- (23) *Avoid opening into the oral cavity, as far as possible in operations on the jaw from outside but it is best to avoid outside operations on jaw*
- (c) **Palate**
- (24) *Embryologically alveolus belongs to the lip rather than to the palate.*
- (25) *Practical classification of hare lip and cleft palate*
 (1) *Pre alveolar*
 (2) *Alveolar*
 (3) *Post alveolar*
- (26) *Varieties of cleft palate*
 (1) *Cleft soft palate*
 (a) *Rudimentary uvula with short soft palate*
 (b) *Bifid uvula*
 (c) *Cleft soft palate*
 (2) *Cleft hard palate*
 (a) *Unilateral*
 (b) *Bilateral*
 (3) *Cleft soft + hard palate*
 (a) *Intermaxillary cleft*
 (b) *Bipartite*
 (c) *Tripartite*
 (4) *Cleft (soft + hard) palate + hare lip*
 (a) *Unilateral*
 (b) *Bipartite cleft palate*
 + (β) *Bipartite cleft palate*

(b) Bilateral ·

(α) Bilateral hare lip

+ (β) Tripartite cleft palate

(27) *A long mobile soft palate in such a position as will provide an efficient oro nasal sphincteric control should be the main object of cleft palate surgery. If the patient can speak clearly and do blowing tests which indicate good oro nasal sphincteric control, the operation is successful, no matter what the anatomical result is*

(28) Accuracy of speech production must be the standard by which surgical results of palatoplasty are judged.

Groups (1) Perfectly normal

(2) Nasal twang

(3) Consonant deficiency

(p, t, k, ch, s, z)

(29) Successful operation

(a) Before third year normal speech in 98%

(b) After third year normal speech in 60%

(30) Enumeration of operations for cleft palate

Operation	Technique	Remarks
(1) Brophy	Maxillary wiring	Bone necrosis
(2) Lane	Muco periosteal flaps	Immobile soft palate
(3) Langenbeck	Lateral incisions	Forward soft palate
(4) Axhausen	(a) Bridge flap + (b) Cellophane }	
(5) Wardill	(a) Pharyngoplasty + (b) Palatoplasty }	
(6) Dorrance	Push back	Severe
(7) Veau	Vomerine flap	Mid hole
(8) Gillies Fry	(a) Soft palatoplasty + (b) Obturator }	Changing obturator

(31) Secondary procedures

(1) Relaxation of tension

(A) Push back

(B) Veau's (a) V flap

(b) Vomerine flap

(C) Wardill's four flaps

(2) Veau's or Axhausen's three layer sutures

(a) Nasal mucosa

(b) Soft palate muscles

(c) Buccal mucosa

(3) Oro nasal isthmus narrowing

(A) Wardill's pharyngoplasty

(B) Dennis Browne's

(a) Ring suture

(b) Fracture of larynx tip

- (c) Muscle transplantation
 (Medial displacement of separated lateral palatal muscles)
- (32) *Some essential points in palatoplasty*
 (1) *Operation before child learns to talk*
 (2) Good general condition
 (3) Good anaesthesia
 (4) *Absolute absence of tension on soft parts*
 (a) Complete separation of
 (α) Muco periosteum from hard palate
 (β) Soft palate from hard palate
 (γ) Lateral palatal muscles from internal pterygoid plate
 (b) Fracture of hamular processes
 (5) Good vascular supply to soft tissue flaps
 Save the palatine vessels
 (6) *No strain on suture lines*
 (7) Three layer sutures
 (8) *Long mobile soft palate or forward pharyngeal wall*
 (a) Push back
 (b) Pharyngoplasty
 (c) Ring suture
 (9) Efficient vocal rest for three weeks after operation
 (10) *Post operative vocal training*
- (33) Failure of cleft palate operation
 (1) Anatomical failure
 Recurrence of the cleft giving way of sutures
 (2) Functional failure
 (a) Anatomical failure
 (b) Immobile, scarred, short, forward soft palate
 (c) Too late operation
 (d) Inefficient vocal training
- (34) A palate that fails to heal following the initial operation will become much harder to repair in subsequent operations
- (35) *Common causes of perforation palate*
 (1) Gumma
 (2) Carcinoma
 (3) *Post operative cleft*
- (36) Mouth cavity and the tongue:
 (A) Lymph zones (a) Apical bilateral
 (b) Lateral unilateral
 (c) Medial bilateral

- (B) Lymph glands (a) Submental
(b) Submaxillary
(c) Deep superior cervicals
Jugulo digastric
(d) Inferior cervicals
Jugulo omohyoid
- (37) Beware of operating on a tumour at the base of the tongue it may be lingual thyroid
- (38) Hæmorrhage from the tongue
(1) Pull on apical anchor stitch
(2) Heath hook forwards the lingual base together with the hyoid by the fore finger
(3) Under running suture
(4) Ligature of (a) Lingual artery
(b) External carotid artery
- (39) In local stomatitis find out and treat the cause
- (40) Stomatitis and dry mouth are important etiological factors in the causation of sialoadenitis
- (41) *Beware of cancrum oris in a marasmic child during or after any acute illness*
- (42) *In any acute inflammatory focus of the tongue or oropharynx, beware of*
(a) *Œdema glottis*
(b) *Aspiration pneumonia*
(c) *Secondary hæmorrhage*
- (43) *Mouth hygiene must be scrupulously attended to*
(a) *Before and after an operation on*
(a) *Oral cavity*
(b) *Pharynx*
(c) *Digestive system*
(b) *Where nothing is allowed by the mouth*
(a) *Expectant treatment of acute abdomen*
(b) *Post-operative treatment of abdominal oper*
(c) *Mechanical alimentary obstruction*
(c) *Sepsis of*
(a) *The oral cavity*
(b) *Pharynx*
(c) *Digestive system*
- (44) Syphilis of the mouth and tongue
(A) Chancre (a) Lips
(b) Tongue.
(B) Secondary (a) Erosive syphilide or mucous patch
(b) Chronic leukoplakic glossitis
(C) Tertiary (a) Gumma of the tongue
(1) Local (a) Superficial
(p) Deep

- (2) Diffuse
 - (b) Perforation of the palate
 - (c) Fournier's malperforant buccal
 - (a) Falling teeth
 - (β) Alveolar absorption
 - (γ) Maxillary antrum necrosis.
- (45) *Most common intra oral syphilitic lesions*
 - (1) *Chancre lip or tongue*
 - (2) *Secondary syphilitic ulcers*
 - (3) *Mercurial stomatitis*
 - (4) *Gumma tongue*
 - (5) *Gummatous perforation of the palate*
- (46) *Any indolent lesion on the lip or apex of the tongue, do not forget chancre*
- (47) *Iodides and mercury are contraindicated in ulcers of the tongue even in the presence of positive Wassermann*
- (48) *Cysts in the floor of the mouth*
 - (A) Buccal
 - (a) Mucous
 - (b) Ranula
 - (α) Simple
 - (β) Deep
 - (B) Bucco cervical
 - (a) Dermoid
 - (b) Thyroglossal cyst
- (49) *Ranula or mucous cysts are translucent and contain glairy fluid while dermoids are opaque and contain sebaceous material*
- (50) *Benign tumours of the mouth and tongue*
 - (1) *papillomata*
 - (a) Congenital
 - (b) Inflammatory
 - (c) Leukoplakic
 - (2) *Mucous and salivary mixed tumours*
 - (3) *Lipoma*
 - (4) *Chondroma*
 - (5) *Osteoma*
 - (6) *Rhabdomyoma*
 - (7) *Fibroma*
 - (a) Simple
 - (b) Neuro fibroma
 - (c) Xanthoma
 - (8) *Angioma*
 - (a) Capillary
 - (b) Cavernous
 - (9) *Lymphangioma* *Macroglossia*
 - (10) *Epulis*
 - (a) Fibrous
 - (b) Fibro angiomatous
 - (c) Giant celled
 - (11) *Lingual thyroid*
- (51) *Malignant tumours of*
 - (1) *Carcinoma*
 - (a)
 - (b)

- (c) Cheek
- (d) Palate
- (e) Floor of the mouth

(2) Sarcoma.

- (52) *Most common malignant tumour of the mouth cavity is squamous carcinoma of the tongue*
- (53) *Most common precancerous lesions of the tongue*
- (a) Dental ulcer
 - (b) Leukoplakia
 - (c) Papilloma
 - (d) Gumma
- (54) *Positive Wassermann does not exclude malignancy. Syphilitic mouth and tongue are the most fertile soil for the development of cancer*
- (55) *Intra buccal and tongue papillomata undergo malignant degeneration by*
- (a) Frequent application of caustics
 - (b) Inadequate radium therapy
- (56) *No caustics have any place in the treatment of tongue lesions, especially chronic except a dyspeptic ulcer, where silver nitrate is occasionally used*
- (57) *Labio alveolar carcinoma is common in paan or betel nut chewers*
- (58) *Any chronic localised abnormality of the tongue after the age of 35 is carcinoma unless proved otherwise by biopsy*
- (59) *Earliest evidence of malignant degeneration of a papilloma is basal induration and surface friability*
- (60) *The most common lesions to be diagnosed from carcinoma tongue, are*
- (a) Dental ulcer
 - (b) Papilloma
- (61) *Never omit a biopsy in every chronic focus in the oral cavity or on the tongue especially after the age of 35. Biopsy is the only certain method in the differential diagnosis and must be resorted to as early as possible*
- (62) *Eradication of precancerous conditions and earliest possible identification of an epithelioma of the tongue are very important*
- (63) *Treatment of intra buccal carcinoma*
- | | <i>Primary</i> | | <i>Lymph metastases</i> |
|-----|----------------|---|-------------------------|
| (A) | Excision | + | Dissection |
| (B) | Radiotherapy | + | Dissection |
| (C) | Radiotherapy | + | Radiotherapy |

- (64) Treatment of tongue carcinoma
- (A) Primary
 - (1) Surgical excision (a) Knife
(b) Cautery
 - (2) Radium
 - (B) Metastases
 - (1) Surgical excision
 - (2) Radiotherapy
- (65) Precedence of stages
- (A) Robust patients
 - Block dissect on of cervical glands
 - ↓ Irradiation or surgery of the tongue
 - (B) Poor operative risks +/or impalpable glands
 - Irradiation or surgery of the tongue
 - ↓ Constant observation of the neck
 - ↓ Block dissection of cervical glands
 - (a) If necessary
 - + (b) Improved general condition
- (66) Three ways of exposure in lingual carcinoma
- (1) Intra buccal (a) Whitehead
(b) Langenbeck
 - (2) Cervical (a) Kocher
(b) Regnoli
 - (3) Combined bone method (a) Syme
(b) Lateral jaw cut
- (67) Preliminary ligation of lingual or ext carotid artery is indicated before the excision of advanced carcinoma tongue and should be done in conjunction with cervical block dissection as a preliminary step to surgical treatment of the primary
- (68) *Every case of intra oral carcinoma should have some form of treatment to the cervical lymphatic area, even when there are no clinically palpable glands*
- (A) Radium or X Rays
 - Ind (a) Impalpable early glands
 - (b) Inoperable glands
 - (c) Inoperable primary
 - (B) Dissection
 - Ind (a) Operable glands
 - (b) Operable primary
- (69) Beware of necrosis jaw in radium treatment of intra oral carcinoma.
- (70) *Beware of (a) avulsion of a tooth and (b) dislocation of the jaw in application of a mouth gag under anaesthesia*
- (71) *Best way of treating anaesthetic trismus is to give more anaesthesia*

- (72) In every operation on oropharynx, pass in an anchor stitch through the apex of the tongue and keep it during and after the operation, till the patient is out of anæsthesia
- (a) To prevent asphyxia
 - (b) To check hæmorrhage from the tongue
- (73) Take care of Wharton's duct in operations on the tongue or floor of the mouth, especially for ranula or tongue tie, to avoid stricture and resultant sialoadenitis
- (74) Post operative treatment in tongue operations
- (1) Mouth antiseptics
 - (2) Respiratory precautions
 - (a) Prop up posture changing
 - (b) Antiseptic inhalations
 - (c) Thoracic applications stupes
 - (d) Expectorant stimulants
 - (3) Blood transfusion if necessary
- (75) In the post operative period in oropharyngeal cases, look for
- (1) Asphyxia
 - (2) Pneumonia
 - (3) Secondary hæmorrhage
- (76) *Blood stained saliva on the 5th or 6th day of oropharyngeal operation or sepsis, may be a death warrant—a precursor of massive secondary hæmorrhage*
- (77) Regurgitation through the nose or nasal voice
- ? (1) Congenital short or cleft palate
 - ? (2) Perforation palate
 - ? (3) Post-diphtheritic paralysis of palate.
- (78) Local applications in tongue lesions
- (A) Apply
 - (a) Chromic acid
 - (b) Lactic acid
 - (c) Salicylic acid
 - (d) Tannic acid
 - (e) Sterile vaseline.
 - (B) Avoid Silver nitrate and other caustics.
- (79) Internal therapy in tongue lesions
- (A) Allow
 - (a) Pot. chlorate
 - (b) Laxatives
 - (c) Intestinal antiseptics
 - (B) Avoid
 - (a) Iodides
 - (b) Mercury
-

CHAPTER II

THE SALIVARY GLANDS

(I) TRAUMA:

(1) TRAUMA TO THE PAROTID.

- Etio: (a) Stabs
(b) Operative incisions

Clinic. Saliva in the discharge

- Compl. (a) **Salivary fistula**
(b) **Facial nerve injury**

Treat. Sutures passing down the whole depth

(2) TRAUMA TO STENSEN'S DUCT

Etio Wounds or operations of the cheek

Clinic: Salivary discharge

- Compl. (a) **Salivary fistula**
(b) **Stricture** with chronic parotitis

- Treat (a) Primary suture over thick silkworm gut
(b) Proximal ligature

(3) TRAUMA TO WHARTON'S DUCT

Etio. Operations for ranula or tongue tie

Clinic: Nil

Compl Stricture → chronic sialoadenitis

- Treat (a) Bougie dilatation
(b) Excision of submaxillary gland

(II) INFLAMMATIONS OF THE SALIVARY GLANDS:

(A) *Acute inflammations.*

(1) ACUTE SEPTIC PAROTITIS

(a) **Ascending septic parotitis:**

Etiology.

- Pre disp (a) Oral sepsis:
 . Near duct orifice (septic tooth)
 { (b) Oral dryness
 { (c) Oral stasis

- Exciting (1) **Oro-pharyngeal and alimentary operations**
(2) Stomatitis
(3) Acute infective toxæmia

- Clinic. (a) Acute spasmodic **trismus**
(b) **Inflammatory swelling of parotid:**
 (a) Unilateral
 ↓ (β) Bilateral

- (c) Inflamed duct orifice
- Diff diag (1) Cellulitis face
(2) Osteomyelitis jaw
(3) Lymphadenitis
(4) Tetanus (trismus)
- Compl (a) Parotid abscess
(b) Salivary fistula
(c) Facial paralysis post operative
(d) Cavernous sinus thrombosis
(e) Cervical cellulitis → œdema glottis
- Treat (1) Oral antiseptics boroglycerol gargles
(2) Sialogogues lemon to the tongue
chewing gum
plenty of fluids
(3) Drugs Lugol's iodine m x
Sulphonamide
(4) Artificial hyperemia
Elastic band around the neck
(5) X Ray therapy
- (b) Parotid abscess
- Clinic (1) Non abatement of signs and symptoms of acute parotitis at the end of five days
(2) Pitting on pressure
(3) No fluctuation Until subcutaneous
- Treat (1) Incision and drainage
Ind (a) Non abated signs at the end of five days
+ (b) Local œdema
+ (c) High temperature
Tech (A) Incisions parallel to nerves
↓ Hilton's method
↓ Drainage
or (B) Blair's method
(2) Regional oral antiseptics sialogogues
(3) General Sulphonamide
- (c) Fulminating or necrosing parotitis
- Clinic (1) Acute pain
(2) Pronounced toxemia
- Compl Parotid sloughing
- Treat Blair's parotid decompression

(2) ACUTE EPIDEMIC PAROTITIS MUMPS

Etio Infection incubation 3-30 days

Path Interstitial and peritubular exudative and hæmorrhagic inflammation

Clinic Consecutively bilateral non suppurating

Compl (a) Epididymo orchitis .

(a) Atrophy testis

(β) Sterility without impotence

or (a) Ovaritis

(b) Mastitis

(c) Pancreatitis → diabetes

(d) Nervous complications

(a) Meningitis

(β) Encephalitis

(γ) Polyneuritis

Treat Symptomatic

(3) SUBMAXILLARY SIALO ADENITIS

Etio (a) Same as parotitis

(b) Exacerbation on chronic

Clinic (a) Inflammation in the submaxillary area

(b) Inflamed Wharton's duct orifice

Diff diag (1) Submaxillary lymphadenitis

(2) Osteomyelitis jaw

(3) Ludwig's angina

Compl Submaxillary cellulitis

↓ Oedema glottis

Treat (a) Acute stage Conservative

(b) Abscess Drainage

(c) Sequelæ Excision

(B) Chronic inflammations

CHRONIC SEPTIC SIALO ADENITIS

Etio (a) Secondary to acute inflammation

(b) Sepsis near the duct orifice ascending

(c) Calculus

(d) Stricture duct

Clinic (1) Chronic tender enlargement

+ (2) Inflamed and discharging duct orifice

(3) Recurrent acute or subacute exacerbations

Diff diag (a) Chronic lymphadenitis

(b) Chronic bone infection

(c) Salivary calculus

(d) Mixed salivary tumour

Compl Salivary fistulæ

Treat (1) Oral hygiene

(2) Salivary drainage sialogogues

- (c) **Inflamed duct orifice**
- Diff diag (1) Cellulitis face
(2) Osteomyelitis jaw
(3) Lymphadenitis
(4) Tetanus (trismus)
- Compl (a) Parotid abscess
(b) Salivary fistula
(c) Facial paralysis post operative
(d) Cavernous sinus thrombosis
(e) Cervical cellulitis → oedema glottis
- Treat (1) Oral antiseptics boroglycerol gargles
(2) Sialogogues lemon to the tongue
chewing gum
plenty of fluids
(3) Drugs Lugol's iodine m xv
Sulphonamide
(4) Artificial hyperemia
Elastic band around the neck
(5) X Ray therapy

(b) **Parotid abscess**

- Clinic (1) Non abatement of signs and symptoms of acute parotitis at the end of five days
(2) Pitting on pressure
(3) No fluctuation Until subcutaneous

- Treat (1) Incision and drainage.

Ind (a) Non abated signs at the end of five days

+ (b) Local oedema

+ (c) High temperature

Tech (A) Incisions parallel to nerves
↓ Hilton's method
↓ Drainage

or (B) Blair's method

(2) Regional oral antiseptics sialogogues

(3) General Sulphonamide

(c) **Fulminating or necrosing parotitis**

- Clinic (1) Acute pain
(2) Pronounced toxicemia

Compl Parotid sloughing

Treat Blair's parotid decompression

(2) **ACUTE EPIDEMIC PAROTITIS MUMPS**

Etio Infectious incubation 3-30 days

Path Interstitial and peritubular exudative and hemorrhagic inflammation

Clinic : Consecutively-bilateral **non-suppurating**

Compl : (a) **Epididymo orchitis :**

(α) Atrophy testis

(β) Sterility without impotence

or (a) Ovaritis

(b) Mastitis

(c) Pancreatitis → diabetes

(d) Nervous complications ·

(α) Meningitis

(β) Encephalitis

(γ) Polyneuritis

Treat . Symptomatic

(3) SUBMAXILLARY SIALO ADENITIS .

Etio . (a) Same as parotitis

(b) Exacerbation on chronic

Clinic : (a) Inflammation in the submaxillary area

(b) **Inflamed Wharton's duct-orifice**

Diff diag . (1) **Submaxillary lymphadenitis**

(2) **Osteomyelitis jaw**

(3) **Ludwig's angina**

Compl Submaxillary cellulitis

↓ Œdema glottis

Treat . (a) Acute stage **Conservative**

(b) Abscess **Drainage**

· (c) Sequelæ . **Excision**

(B) *Chronic inflammations .*

CHRONIC SEPTIC SIALO ADENITIS .

Etio . (a) **Secondary** to acute inflammation

(b) Sepsis near the duct orifice **ascending**

(c) **Calculus**

(d) **Stricture duct**

Clinic : (1) **Chronic tender enlargement**

+ (2) **Inflamed and discharging duct-orifice**

(3) **Recurrent acute or subacute exacerbations**

Diff. diag . (a) **Chronic lymphadenitis**

(b) **Chronic bone infection**

(c) **Salivary calculus**

(d) **Mixed salivary tumour**

Compl . Salivary fistulæ

Treat : (1) **Oral hygiene**

(2) **Salivary drainage : sialogogues**

- (3) Dilatation of the duct **probing**
- (4) Excision in submaxillary gland

(III) SALIVARY CALCULUS:

- Etio** (1) Salivary stasis stricture duct
(2) Chronic sialoadenitis
- Site** (a) Submaxillary gland or duct
(b) Parotid gland or duct in Sudan
- Path** (1) Composition calcium carbonate
(2) Situations (a) Gland tissue
(b) Duct lumen
- Clinic** (1) Chronic inflammatory tender enlargement of the
(2) .
(3) .
(4) .
(b) At meals
- (5) X Ray (a) Plain
(b) Sialography lipiodol
- Diff diag** (a) Lymphadenitis
(b) Submaxillary cellulitis
(c) Mixed tumour
- Compl** (a) Chronic sialoadenitis
(b) Acute sialoadenitis with abscess
(c) Salivary fistula
- Treat** (A) Gland calculus
(a) External incision and removal
(b) Excision of the gland submaxillary
(B) Duct calculus
(a) Dilatation and removal
(b) Buccal incision and removal

(IV) SALIVARY FISTULA

- Etio** (1) Trauma Stabs and operative incisions
(2) Salivary abscess or calculus
(3) Sloughing or ulceration of surrounding tissues
Cancerum oris
- Site** Parotid gland and Stensen's duct
- Path** (1) Gland fistula
(2) Duct fistula (a) Pre masseteric
(b) Masseteric
- Clinic** (1) Internal No signs
(2) External Out pouring saliva
(3) X Rays Sialography
- Compl** (a) Inconvenience
(b) Skin irritation → eczema

Treat : (A) **Gland fistula :**

- (a) Scraping or cauterizing
- (b) Excision and obliterating sutures
- (c) Radiotherapy . radium or deep X Ray.
- (d) Auriculo temporal avulsion

Sequela . facial deformity

(B) **Duct fistula :** Turn external into internal

- (a) Premasseteric
: Pearce Gould's silver seton
- (b) Masseteric .
Kaufmann's rubber tube
- (c) Saposchkoff

(V) **TUMOURS OF THE SALIVARY GLANDS:**(1) **MIXED SALIVARY TUMOUR .**

Etio . Age 20-40

Sites . (1) **Parotid**> (2) **Submaxillary**> (3) **Intra buccal . mixed molar tumour**Path . (a) Origin (1) **Epithelial : adenoma**(2) **Endothelial**(3) **Embryonic**(b) Composition : **Myxomatous to cartilaginous**Clinic : **Hard-fleshy-soft****Lobulated****Encapsuled****Non-tender****Mobile**} . **tumour**(a) **Parotid**

(a) Filling of the space between the angle of the jaw and the mastoid

+ (β) **External displacement of ear lobule**(b) **Submaxillary**

. Lobulated swelling in submaxillary region

Special : (1) **Progressive enlargement**(2) **Recurrence** after removal(3) **Malignant degeneration .**(a) **Recurrence**(b) **Rapid growth**(c) **Surrounding infiltration**(d) **Facial paralysis**Treat : (1) **Early enucleation → Radium**(2) **Radium**(3) **Excision of the gland . submaxillary**Post. compl : (a) **Facial paralysis**(b) **Salivary fistula**(c) **Deformity**

(d) **Recurrence**(e) **Malignancy****(2) CARCINOMA PAROTID:****Etio** Mixed parotid tumour**Path** (a) Primary adeno carcinoma.

Metastases usual

(b) Secondary to mixed tumour.

Metastases unusual

(c) Infiltration from surrounding carcinoma:

Cheek, alveolus

Clinic (1) Tissue infiltration immobility, adhesions

(2) Fungation with everted borders

(3) **Facial paralysis****Treat** (a) **Radium or Radon**(b) **Deep X Ray therapy**(c) **Surgical excision****(VI) MISCELLANEOUS DISEASES:****(1) ACUTE EMPHYSEMA OF THE PAROTID.****Eti o** Glass blowers

Wind instrument players

Clinic Crepitant swelling**(2) VOLVULIC DISEASE****Def** Generalised enlargement of all salivary and lacrimal glands**Path** (a) Chronic inflammation

(b) Benign neoplasm

(VII) SPECIAL PROCEDURES AND OPERATIONS:**(1) SIALOGRAPHY****Def** Radiographic demonstration of the ducts of the salivary glands after injection of lipiodol**Ind** Any chronic abnormality of salivary glands

(a) Chronic inflammations

(b) Calculi

(c) Fistula

(d) New growths

Tech (1) 5 to 1 cc of lipiodol injected into the duct orifice by (a) Syringe

(b) Payne's rubber bulb

↓ (2) X Ray film

(2) BLAIRS PAROTID DECOMPRESSION**Tech** (1) Incision. **Vertical**, in front of the ear
: Zygoma to mandibular angle
: **Down to parotid fascia**

↓ (2) Retraction of undermined ant. skin flap

1 (a) **Transverse incisions in the capsule**

- ↓ (4) Hilton's method
- ↓ (5) Leave the wound open

(3) AURICULO-TEMPORAL AVULSION:

Tech: (1) Incision: vertical
: anterior to ext. aud. meatus

- (2) Isolation of the nerve
- (3) Division of the nerve
- (4) Avulsion by traction with Spencer Wells

(4) EXCISION OF THE SUBMAXILLARY GLAND.

Ind: Any chronic lesion

Anæsth : Regional infiltration :

: Midpoint of post. border of sternomastoid

Tech : (a) Incision : Symphysis

↓ Hyd

↓ 1" below mandibular angle

- (b) Incision of platysma
- (c) Incision of gland capsule
- (d) Blunt dissection of the gland
- (e) Ligature: (α) Facial vessels, if necessary
(β) Wharton's duct
- (f) Separate suture of platysma
- (g) Suture skin

Post. compl: (1) Haematoma
(2) Paralysis of cervical branch of facial nerve
(3) Salivary fistula

(VIII) IMPORTANT POINTS

(A) Trauma:

- (1) *In every case of stab wound of the cheek, explore Stensen's duct.*
- (2) One of the chief complications of parotid trauma is salivary fistula
- (3) Trauma to the Wharton's duct is a complication of .
 - (a) Tongue tie operation
 - (b) Ranula operation.

(B) Inflammations:

- (4) Beware of parotitis in .
 - (a) Mouth stasis + sepsis
 - (b) Oro pharyngeal and alimentary operations
 - (c) Acute toxæmic states
- (5) Keep an eye on parotids in the after-treatment of laparotomies, especially for obstructive lesions.
- (6) *A lemon to suck will prevent post-operative parotitis in majority of cases.*

- (7) *A rise in temperature or stiffness about the jaw three or four days after an abdominal operation denotes parotitis*
- (8) Parotid abscess
 - (a) Do not wait for fluctuation
 - (b) Incise if signs persist after fifth day
 - (c) Incisions parallel to facial branches
 - (d) Hilton's method
 - (e) Blair's decompression in fulminating cases.
- (9) Mumps
 - (a) One attack of mumps confers permanent immunity
 - (b) Suppuration is rare
 - (c) *Modern view is that mumps is primarily a disease of the nervous system due to neurotropic virus*
 - (d) Complications of mumps may precede the appearance of mumps themselves.
- (10) *Submaxillary sialadenitis can be diagnosed from lymphadenitis, cellulitis or osteomyelitis by absence of trismus*

(C) Salivary fistula :

- (11) Salivary fistula is a likely complication of any trauma, infection or operation of a salivary gland or its duct
- (12) Avoid injury to the salivary ducts in operations on the cheek and the floor of the mouth
- (13) In every case of trauma to the face or mouth, exclude implication of salivary ducts
- (14) Fistulae of submaxillary and sublingual glands do not require any treatment as a rule.
- (15) *Treatment of an external salivary duct fistula is to turn it into an internal or buccal fistula*

(D) Salivary tumours :

- (16) *Most common tumour of the parotid is mixed tumour*
- (17) Pathognomonic signs of mixed parotid tumour are .
 - (a) Filling up of the hollow between the jaw angle and the mastoid
 - (b) *Lateral deviation of the ear lobule*
 - (c) Lobulations of the tumour
- (18) Biopsy is not to be recommended in mixed salivary tumours.
- (19) Mixed parotid tumour is midway between innocent and
 - (a)
 - (b)
 - (c) *Sudden infiltration*
- (20) Radiotherapy must always follow the removal of a mixed parotid tumour.

- (21) *Pathognomonic sign of parotid malignancy is facial nerve paralysis due to nerve infiltration*

(E) **Miscellaneous :**

- (22) Differential diagnosis between chronic sialoadenitis and mixed tumour of a submaxillary gland, is the presence of tenderness in the former
- (23) *Most common post-operative complications in the parotid region are .*
- (a) Salivary fistula
 - (b) Facial paralysis
- (24) Indications for deep X Ray therapy in parotid lesions
- (a) Ptyalism
 - (b) Salivary fistulae
 - (c) Malignancy
- (25) Chief conditions to be differentially diagnosed are
- | | | |
|-----------------------|---|---------|
| (a) Lymphadenitis | } | Trismus |
| (b) Cellulitis | | |
| (c) Osteomyelitis jaw | | |
- and (d) Sialoadenitis Trismus present in parotid
absent in submaxillary
-

CHAPTER III

THE ŒSOPHAGUS

I CONGENITAL AFFECTIONS:

- (1) Total absence
- (2) Bifurcation
- (3) Atresia with œsophago-tracheal fistula
- (4) Valves or membrane
- (5) Stenosis
- (6) Diverticulæ
- (7) Mega-œsophagus

Def Enormous dilatation and tortuosity of œsophagus

Clinic Dysphagia

Sign Barium meal

- (8) Short œsophagus with thoracic stomach

(II) TRAUMA:

(1) RUPTURE ŒSOPHAGUS:

Etio: Chronic alcoholism

Cause: Vomiting

Clinic: (a) Painful dysphagia
+ (b) **Gastric perforation syndrome**
or (b) Pneumothorax
or (b) Mediastinal emphysema

Diff. diag: Gastric perforation

Compl: Cervical or mediastinal sepsis

Treat (A) Trans pleural exploration
↓ Repair œsophagus
↓ Drainage of peri œsophageal spaces
+ (B) Gastrostomy

(2) INJURIES OF THE ŒSOPHAGUS:

(A) From without:

Etio Stab-wounds neck

Clinic: Discharge of saliva from the wound

Compl. Cervical or mediastinal sepsis

Treat: Repair + drainage + temporary gastrostomy

(B) From within:

Etio: (a) Impacted sharp foreign bodies
(b) Faulty instrumentation

Clinic: (1) Painful dysphagia
(2) *Hæmatemesis*

- Prophylaxis: (a) Exclude before instrumentation
 (α) **Thoracic aneurysm**
 (β) Cardio vascular disease
 (γ) Renal disease
 (b) Never use force
 (c) Pass the instrument under direct vision

(3) FOREIGN BODIES IN ŒSOPHAGUS

Objects: Toys, pins, coins, false teeth, instruments

- Sites: (a) 7" from teeth commencement
 (b) **Episternal notch**
 (c) 11" from teeth bronchial crossing
 (d) 17" from teeth cardiac orifice

- Clinic: (1) History (a) Absent in children and insane
 (b) Present in adults and sane
 (2) Dyspnœa + dysphagia
 ↓ (3) **Dysphagia only**
 (4) X Rays

- Compl. (a) Ulceration
 ↓ (b) Perforation (α) Peri œsophageal cellulitis
 (β) Respiratory complications
 (γ) Fatal hæmatemesis
 or (c) Passage into stomach
 (d) Stricture œsophagus

- Treat: (A) Upto cricoid 7" from teeth
 : Extraction through the mouth by
 (a) : **Coin-catcher**: Under X Ray screen
 or (b) **Œsophagoscope**: under direct vision
 (B) Upto 6" below cricoid 13" from teeth
 (a) Extraction *via* cervical **œsophagotomy**
 (b) Extraction by œsophagoscope
 (C) Beyond 13" from teeth:
 (a) Extraction through **gastrotomy**
 (b) Extraction by œsophagoscope

(III) ŒSOPHAGITIS:

(1) ACUTE ŒSOPHAGITIS.

- Etiology: (a) Acute specific fevers
 (b) Corrosive burns
 (c) Impacted foreign bodies
 (d) Infantile: oral infection
 (α) Diphtheritic
 (β) Vincent's
 (γ) Thrush:

Treat: Application of 1% aqueous solution of gentian violet

(2) CHRONIC ŒSOPHAGITIS

- Etio (a) Chronic alcoholism
 (b) Stricture
 (c) Diverticulum

(IV) ULCERS OF THE OESOPHAGUS:

(1) TRAUMATIC

- Etio (a) Burns
 (b) Impacted foreign bodies

(2) TUBERCULOUS

- Etio Associated with advanced phthisis

(3) SYPHILITIC

- Clinic (a) Dysphagia in a syphilitic patient
 (b) Therapeutic test
 (c) Positive Kahn

Diff diag Carcinoma œsophagus

(4) PEPTIC

- Etio Regurgitation of gastric juice
 Site Cardiac end

- Clinic (a) Pain immediately after food
 (b) Dysphagia painful
 (c) Vomiting
 (d) Hæmorrhage in vomits and stools

- Signs (a) Œsophagoscopy
 (b) X Rays

Diff diag (1) Carcinoma œsophagus
 (2) Non malignant ulcers or stricture
 (3) Gastric ulcer
 (4) Heart lesions

- Compl (a) Hæmorrhage
 (b) Perforation with its sequelæ
 (c) Stricture

- Treat (1) Conservative rest + diet + alkalis
 (2) Operative temporary gastrostomy

(5) CARCINOMATOUS (See under New Growths)

(V) PERFORATIONS OF THE OESOPHAGUS:

- Etio (a) Traumatic foreign bodies
 (b) Ulceration
 (c) Carcinoma

Site Upper part

- Clinic (1) History of trauma (in a)
 (a) Ingestion of sharp foreign body
 (b) Instrumentation
 (2) Pain + dysphagia + tenderness

- (3) Pyrexia + swelling + emphysema
- (4) Radiography
- (5) Œsophagoscopy

Compl (a) Mediastinitis
 (b) Emphysema or pneumothorax
 (c) Hæmatemesis

Treat. Incision and drainage: Of peri œsophageal tissues

Tech (In Superior Mediastinum)

- (a) Incision along ant. border of sternomastoid
- (b) Retraction of thyroid gland
- (c) Drainage of fascial planes

Post. compl (1) Broncho pneumonia
 (2) Secondary hæmorrhage

(VI) OESOPHAGEAL OBSTRUCTION: DYSPHAGIA

(A) LUMEN OBSTRUCTION

Etio Foreign bodies (See above)

(B) WALL OBSTRUCTION

(a) Spasmodic:

- (1) Globus hystericus
- (2) Cardiospasm.

(b) Paralytic:

- (a) Diphtheria
- (β) Glosso pharyngeal paralysis
- (γ) Post lacerate foramen syndrome

(c) Cicatricial

(d) New growths:

Carcinoma (See under New Growths)

(e) Diverticulæ

(C) EXTRINSIC OBSTRUCTION

(a) Aortic aneurysm:

Etio Syphilis

Clinic Dysphagia
 Dyspnœa + cyanosis
 Hoarse voice

N B Exclude aortic aneurysm before œsophageal instrumentation

Compl Rupture → hæmatemesis

(b) Mediastinal tumours:

- (a) Retro sternal goitre
- (β) Enlarged thymus

(c) Enlarged mediastinal lymph glands:

- (a) Tuberculosis
- (β) Lymphadenoma
- (γ) Lympho sarcoma
- (δ) Leukæmia

- (d) Mediastinal abscess T B spine
(e) Diaphragmatic hernia

(VII) CICATRICIAL STENOSIS OF THE OESOPHAGUS

- Causes** (1) **Traumatic** (a) Caustics
(b) Impacted foreign bodies
(2) **Ulcerative fibrosis** (See under Ulcers)
(3) **Syphilis**
(4) **Carcinomatous**
- Sites** Three anatomical constrictions
- Clinic** (a) **Painless, progressive dysphagia**
(b) **History of etiology**
(c) **Oesophagoscopy**
(d) **X Rays**
(e) **Bougies**
- Diff diag** (1) **Nervous affections** Cardiospasm
(2) **New growths** Carcinoma
(3) **Extrinsic causes of dysphagia**
- Compl** (a) **Oesophagitis**
(b) **Peri oesophagitis**
(c) **Ulceration** → perforation → cellulitis
(d) **False passage** in bouginage
- Treat** (1) **Bouginage**
Def Dilatation by bougies through oesophagoscope
Method (a) **Intermittent**
(b) **Continuous** Symond's or Souttar's tube
Tech (1) **Antegrade** Oral route
(2) **Retrograde** Gastrostomy route.
(2) **Gastrostomy**
(3) **Reparative surgery** Cardioplasty

(VIII) NERVOUS DISTURBANCES OF OESOPHAGUS

(1) GLOBUS HYSTERICUS

- Etio** Hysterical women
Clinic (1) **Capricious dysphagia**
(2) **Other hysterical stigmata**
Treat Psychotherapy

(2) CRICO-PHARYNGEUS SPASM

(See under Pharynx also)

- Etio** Neurotic and anæmic middle aged women
Path (1) **Spasm of the crico pharyngeus part of inferior constrictor muscle.**
(2) **Atrophy of oral and pharyngeal muc. mem.**
Clinic **Plummer Vinson Syndrome**
(1) **Crico-pharyngeus dysphagia**
(2) **Oro pharyngeal muc. mem. atrophy**
(3) **Anæmia**
(4) **Splenic enlargement** occasional

- Compl. (a) Diverticula
 (b) Carcinoma
 Treat: (a) Bouginage
 (b) Anti anæmic

(3) CARDIOSPASM (Achalasia cardia)

Def. Diffuse dilatation and hypertrophy of the œsophagus, associated with narrow cardiac opening due to achalasia cardia

Etio. Young adult females between 25-45

Theories (1) Achalasia:

Want of relaxation of the involuntary cardiac circular sphincter due to abnormality of the neuromuscular control, caused by want of balance between the sympathetic and the parasympathetic

- (2) Congenital
- (3) Primary œsophagectasia
- (4) Phrenospasm
- (5) Cardiospasm
- (6) Secondary

Reflex to some irritative focus near by

- Path (1) Cardiac narrowing
 (2) Œsophageal hypertrophy and dilatation
 (a) Fusiform
 (b) Flask shaped
 (c) S shaped
 (3) Œsophagitis with ulceration

- Clinic (1) **Intermittent dysphagia** with regurgitation
 (2) Easy passage of stomach tube after a temporary halt at 17" from the teeth
 (3) X Ray after barium meal
 (4) Œsophagoscopy

- Compl (a) Perforation and its sequelæ
 (b) Regurgitation → respiratory aspiration

Treat (A) Medical:

- (1) **Hurst's bougies**: (20 oz with mercury)
 10 min before every meal for 5-10 min
 First time through œsophagoscope

- + (2) **Anti-spasmodics**: Belladonna
 Atropine
 Eupavarine

- + (3) **Psychotherapy**

(B) Surgical:

- (1) Mikulicz

- (a) Gastrostomy
- ↓ (b) Cardiac dilatation by finger
- (2) Laparotomy
- ↓ Dilatation of diaphragmatic opening
- (3) Heller Section of muscle coat
- (4) Cardio plasty
- (5) Œsophago gastrostomy
- (6) Knight: Left gastric arterial sympathectomy

(4) ŒSOPHAGEAL PARALYSIS (See under VI)

(IX) NEW GROWTHS OF THE ŒSOPHAGUS:

(A) INNOCENT

- (1) Cysts
- (2) Papillomata
- (3) Fibromata
- (4) Lipomata
- (5) Myomata

(B) MALIGNANT

- (1) Sarcoma

Etio More common after 40

Clinic Emaciation out of all proportions to dysphagia

(2) CARCINOMA ŒSOPHAGUS

Etio (a) Frequent

(b) Males: (except post cricoid)

(c) Age (a) 85% over 50
(β) 40% over 60

(d) Sites Anatomical constrictions:

(a) 11" from teeth
> (b) 17" from teeth
> (c) 7" from teeth

Path. (1) Microscopic (a) Annular stricture
(b) Papillomatous
(c) Ulcerative
(d) Diffuse
(e) Multi-centric

(2) Microscopic

(a) Squamous, upper two thirds
(b) Columnar lower one third
(c) Basal celled

(3) Spread (a) Direct peri-œsophageal
(b) Lymphatic site
(α) Cervical glands
(β) Mediastinal glands
(γ) Callic glands
(c) Liver

Clinic	(1) Retrosternal oppression	} in a person past middle age
↓	(2) Progressive dysphagia	
↓	(3) Regurgitation of food	
↓	(4) Emaciation rapid	
Signs	(a) Barium meal	
	(a) Tortuous channel	
	(β) No dilatation of lumen	
	(1) Œsophagoscopy	
	(a) No respiratory movements	
	(β) Indurative infiltration	
	(c) Bougies (contra indicated)	
Diff diag	Every cause of dysphagia	
	(1) Simple ulcers	
	(2) Simple stenosis	
	(3) Nervous abnormalities	
	(4) Diverticulum	
	(5) Extrinsic causes	
Compl	(a) Broncho pneumonia Intercurrent	
	(b) Hæmatemesis Rupture into vessels	
	(c) Starvation cachexia	
	(d) Perforation (a) Mediastinitis	
	(β) Respiratory lesions	
	(γ) Fistulæ	
	(e) Infiltration Recurrent laryngeal nerve	
	Phrenic nerve	
	Thoracic duct	
Prognosis	Average life 9-14 months	
Treat	(1) Palliative Gastrostomy	
	(2) Deep X Rays	
	(3) Radium tube or radon	
	(4) Intermittent bouginage	
	(5) Intubation	
	(a) Symond's gum elastic	
	(b) Souttar's metal	
	(6) Diathermy	
	(7) Œsophagectomy	
	(8) Local cocaine + morphia injections	

(X) DIVERTICULAE OF THE OESOPHAGUS

(See under Pharynx also)

Etiol Men above 55

Path (a) Causes

(α) Congenital

(β) Acquired

Prolapse of the muc mem through a weak area in the musculature due to

(a) Muscular degeneration

(b) Sphincteric spasm

- (b) Varieties (1) Pressure diverticula
(2) Traction diverticula
(3) Pressure traction diverticula
- (c) Sites (1) Pharynx } (See under Pharynx)
(2) Pharyngo-oesophageal }
(3) Epibronchial } due to peri-oesophageal inflammations.
(4) Epiphrenic }
- Clinic (1) Dysphagia
(2) X Rays Dense, sharply-defined, rounded, regular bordered shadow with over flow above the level of its lowest limit
(3) Œsophagoscopy
- Compl (1) Peridiverticulitis → adhesions
(2) Perforation (a) Mediastinitis
(b) Respiratory complications
- Treat (A) Palliative bland diet + sac lavage
(B) Operative
(1) Invagination
(2) Diverticulopexy Hill
(3) Purse string obliteration Bevan
(4) Anastomosis to stomach
(5) Excision
(a) One-stage œsophagoscopic
(b) Two stage

(XI) OESOPHAGEAL VARICES.

- Etio (a) Congenital
(b) Cirrhosis liver
- Path Varicosity and tortuosity of œsophageal veins
- Clinic Hæmatemesis

(XII) OPERATIONS ON THE OESOPHAGUS:

(1) SURGICAL EXPOSURE

- Pre oper (1) Oral hygiene
(2) Preliminary gastrostomy
(3) Blood transfusions
(4) High caloric intake
- Ind (1) Carcinoma
(2) Diverticulum
(3) Foreign bodies
- Routes (A) Trans-pleural Lateral approach
(1) Right (a) Upper 2nd rib
Sternum
4th rib
(b) Lower 6th rib
cartilage to scapula
(2) Left Lower 6th rib
cartilage to scapula

(B) Mediastinal Posterior approach

(1) Right (a) Incision

2" right of midline

2nd rib to 8th rib

Vertical, curving out at lower border

↓ (b) Resection of 5th, 6th & 7th ribs

(2) Left (a) Incision

3 fingers breadth from midline

3rd rib to 11th rib

↓ (b) Resection of 4th to 11th ribs

(C) Abdominal Anterior approach

(1) Laparotomy

Median

Ensiform to umbilicus

(2) Merwedel

(a) Incision

(α) Median vertical

+ (β) Horizontal upto costal margin

↓ (b) Resection of 6th 7th, 8th & 9th costo chondral junctions

Indications of different exposures

(1) Upper œsophagus

Right trans pleural

(2) Middle œsophagus (lung root)

(a) Right mediastinal

(b) Right trans pleural

(3) Lower œsophagus

(a) Left trans pleural

(b) Left mediastinal

(4) Cardia

(a) Trans pleural left 9th intercostal

(b) Trans peritoneal

(c) Trans gastric

(2) ŒSOPHAGOSCOPY

Pre-oper X Ray exclude aortic aneurysm

Anæsth (a) General inhalation

(b) Evipan

(c) Local

Position Chevalier Jackson

(a) Flexion head cervical course

↓ (b) Extension head thoracic course

Difficulties (1) Crico-pharyngeal constriction

(2) Light anæsthesia

Compl Perforation with false passage

↓ (a) Hæmorrhage

(b) Sepsis

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(XIII) IMPORTANT POINTS

- (1) Important anatomical points of the œsophagus where it is constricted and, therefore, is a frequent seat of pathology are

- (a) 7" from teeth Commencement
- (b) 11" from teeth Bronchial crossing
- (c) 17" from teeth Cardiac orifice

These points are frequent seats of

- (1) Impacted foreign bodies
- (2) Instrumental difficulties and trauma
- (3) Strictures
- (4) Carcinoma
- (5) Diverticula

- (2) Normal capacity of œsophagus is 150 c cs

- (3) Another common site of impaction of foreign bodies especially in children is the episternal notch

- (4) If a foreign body cannot be seen by an œsophagoscope and a bronchoscope look for it in

- (a) Vallecula
- (b) Pyriform fossa
- (c) Œsophageal fold
- (d) Stomach
- (e) Nasopharynx

- (5) Never accept old X Ray films for diagnosis of seat of impaction of foreign bodies before using œsophagoscope. Always take a recent film or screen just before œsophageal manœuvres

- (6) Coin-catcher should always be used under screen and only for flattened objects in the pharynx or upper œsophagus.

- (7) Most common causes of œsophageal dysphagia

- (1) Trauma
- (2) Stricture syphilis
- (3) Carcinoma
- (4) Cardiospasm

- (8) Dysphagia

- | Cause | Nature of dysphagia |
|-----------------|---------------------------------------|
| (a) Cardiospasm | Intermittent |
| (b) Stricture | Continuous + progressive → stationary |
| (c) Carcinoma | Continuous + progressive → → → |

- (9) In any kind of dysphagia cachexia is early and marked due to starvation and so is not a point in differential diagnosis between innocent and malignant states.

- (10) *Steadily progressive dysphagia in older people*
? Carcinoma œsophagus

- (11) Impaction of a foreign body is the most frequent cause of acute dysphagia

- (12) All treatment of oesophageal stenosis should be based on the endoscopic examination of the stricture
- (13) *Blind bouginage should never be undertaken under general anaesthesia*
- (14) *More than 80% of carcinomata arise either at or below the tracheal bifurcation*
- (15) *85% of carcinoma oesophagus are over 50 and almost 40% are over 60*
- (16) Any patient who develops a disturbance of the act of deglutition should be immediately referred to a competent radiologist for X Ray Oesophagoscopy is advised even if X Ray is negative
- (17) Oesophagoscopy is indicated in every case of minor difficulties in swallowing or in cases of persistent lower substernal discomfort after deglutition
- (18) The fatality of oesophageal carcinoma lies in
 - (a) Rapid infiltration of vital structures
 - (b) Late appearance of symptoms
 - (c) Technical difficulties of excision
- (19) *Out of every 10 cases of oesophageal carcinoma, 9 will die of broncho pneumonia and 1 from hæmatemesis*
- (20) *Oesophageal varices in cirrhosis of the liver, are the most common cause of profuse hæmatemesis*
- (21) Indications for gastrostomy
 - (1) Active stage of ulceration
 - (2) Stenosis
 - (3) Carcinoma
 - (4) Preoperative
 - (5) Palliative
- (22) *Gastrostomy is a life saving measure in oesophageal obstruction*
- (23) Gastrostomy is always a 'wise accompaniment of any plastic operation on oesophagus
- (24) *Exclude aortic aneurysm before oesophageal instrumentation in every case*
- (25) X Ray appearances
 - (1) Diverticula
 - (a) Barium out flow is higher than the lowest level
 - (b) Regular flow
 - (2) Stricture
 - (a) Barium out flow at the lowest level

- (3) Carcinoma *
 - (a) Barium out flow at the lowest level
 - (b) Irregular and tortuous flow
 - (4) Cardio spasm
 - Spindle shaped œsophagus
 - (5) Mega-œsophagus *
 - : Tortuous œsophagus.
 - (26) *Sympathetico parasympathetic neuro muscular disturbances:*
 - (a) *Crico pharyngeus achalasia*
 - (b) *Cardiospasm*
 - (c) *Congenital pyloric stenosis*
 - (d) *Megacolon*
 - (e) *Congenital hydro nephrosis and hydro ureter.*
-

CHAPTER IV

GASTRO-DUODENAL SURGERY

(A) THE STOMACH

(I) CONGENITAL ABNORMALITIES:

(1) ATRESIA OF THE PYLORUS

- Clinic (a) Vomiting from birth
(b) Acute gastric dilatation
(c) Retraction of the rest of the abdomen

(2) HYPERTROPHIC PYLORIC STENOSIS

Def Pyloric obstruction due to

- (a) Spastic hypertrophy of pyloric sphincter
+ (b) Œdema of the pyloric mucosa

Theories

(A) Sphincter theory:

(1) Thomson Primary spasm due to

- (a) Nervous inco ordination
or (b) Hyper acidity
or (c) Hyperæsthesia
or (d) Hyper adrenalism

(2) Achalasia:

- (a) Inco ordination of neuromuscular control
↓ (b) Achalasia of pyloric sphincter
↓ (c) Sphincteric hypertrophy
↓ (d) Pyloric obstruction

(B) Pyloric muscle theory:

(3) Hirschsprung

: Primary pyloric hyperplasia

(4) Neuromuscular pyloric hyperplasia:

- (a) Sympathetic or filling mechanism
> (b) Parasympathetic or emptying mech
↓ (c) Hypertrophy of
(a) Circular muscle of the pylorus
(β) Longitudinal muscle of the pylorus
+ (d) Circular pyloric sphincter is normal

Etio First born male infant

- Clinic (1) Latency: 3 weeks (1st week to 6th week)
(2) Projectile, regurgitant vomits with no bile
(3) Dilated stomach with visible peristalsis
(4) Acorn like pyloric tumour
(5) Constipation
(6) Dehydration and starvation cachexia

Sign	X Rays	gastro stasis
Diff diag	(1)	Pylorospasm Response to (a) Luminal $\frac{1}{4}$ th- $\frac{1}{2}$ th gr (b) Atropine 5 min of 1-1000 sol
	(2)	Gastritis
	(3)	Congenital pyloric atresia Birth vomiting with no bile
	(4)	Congenital duodenal atresia Birth vomiting with bile
Compl	(1)	Tetany alkalosis
	(2)	Jaundice
	(3)	Cachexia
Treat	(A)	Medical: (1) 4 hourly feeds Breast milk + 10% glucose (2) No feeding after each vomit (3) Antispasmodics before each feed (a) Eumydrine (b) Luminal 1/8th 1/6th gr (c) Atropine 1 in 1000 5 min. (4) Gastric lavage B D By normal saline Do not use soda-bi-carb solution (5) Parenteral hydrotherapy (a) Normal saline } subcutaneous (b) 5-10% dextrose } intravenous (c) Hartmann's sol } intraperitoneal (6) Blood transfusion 10 ccs per pound weight
	(B)	Surgical Fredet Ramstedt
Tech	(See under operations)	
Post compl	(1)	Shock and collapse
	(2)	Inanition cachexia
	(3)	Hemorrhage intraperitoneal
	(4)	Peritonitis duodenal rupture
	(5)	Enteritis
	(6)	Hyperpyrexia
	(7)	Continued vomiting: (a) Incomplete division of sphincter (b) Intolerance of milk (c) Gastric spasmophilia (d) Peritonitis
	(8)	Wound complications (a) Burst abdomen (b) Suppuration (c) Ventral hernia
	(9)	Chest complications: Broncho pneumonia

(II) TRAUMA:**(1) RUPTURE STOMACH**

Etio (a) External blows, run overs

(b) Internal distension
instrumentation
foreign bodies

Clinic Perforative peritonitis local or general

Treat Exploratory laparotomy

(2) WOUNDS OF THE STOMACH

Etio Stabs, gun shot wounds

Clinic (a) Epigastric wound + shock

↓ (b) Perforative peritonitis

Signs **Depend on the contents of the stomach at the time of injury**

Treat **Exploration → Suture → Peritoneal toilet**

Ind **Every stab wound over the abdomen**

(3) FOREIGN BODIES IN THE STOMACH

Etio Children, lunatics, jugglers, hysterics

Objects Toys, coins, pins, hairballs

Clinic (1) History or no history

(2) Gastritis or gastric obstruction

(3) X Rays

Compl (a) Obstruction

(b) Ulceration → perforation → peritonitis

Treat (A) **Obstructive or perforative objects**
Immediate removal through gastrotomy

(B) **Passable non-dangerous objects :**

: Conservative and observative .

(1) Normacol, bulky food

(2) **No purgatives ; give lubricants**

(3) Constant observation

(a) Signs of obstruction

(b) Every stool

(c) Repeated X Rays

(C) **Potentially dangerous objects :**

(1) **Constant observation**

↓ (2) **Operative interference if**

(a) Appearance of urgent signs

(b) Stasis at one spot (X Rays)

(4) BURNS OF THE STOMACH

Etio (a) Accidental

(b) Suicidal

(c) Homicidal

Cause Caustics sulphuric or nitric acids
... alkalies

- Clinic** (1) History
 (2) Acute gastritis + shock
 (3) Foul smelling coffee ground vomits
- Diff diag** (a) Acute gastritis
 (b) Gastric ulcer with hæmorrhage
- Compl** (1) Perforation → peritonitis
 (2) Cicatrisation (a) Cardiac
 (b) Pyloric
 (c) Hour glass
 (3) Lung complications
- Treat** (1) **Chemical antidotes and emollients**
 (2) Rectal feeding
 (3) Hydrotherapy rectal, cutaneous, venous
 (4) **Jejunostomy** : For feeding
- Ind Gastritis persisting after 2 week*

(III) PEPTIC ULCER :

Def Ulceration due to digestive action of acid gastric juice on a devitalised mucous membrane exposed to its action

- Varieties** (1) Oesophageal rare
 (2) Gastric : Occasional
 (3) Duodenal : Most common
 (4) Gastro jejunal or anastomotic } post operative
 (5) Jejunal
 (6) Meckel's diverticular rare

(A) ACUTE PEPTIC ULCER

Path Acute erosion due to auto-digestion of the gastric mucous membrane, the resistance of which has been lowered by

- (a) Acute or chronic infective toxæmia
 or (b) Avitaminosis of vit. A
 Small, punched out, superficial and multiple
 With associated gastritis

- Pre lesions** (1) Arterial embolism or thrombosis
 (2) Toxic necrosis
 (3) Lymphoid folliculitis

Association with

- (a) Acute gastritis
 (b) Chronic gastric ulcer
 (c) Gastric carcinoma

- Clinic** (1) **Acute hæmatemesis** or **melæna**
 or (2) Sudden perforation
 or (3) **Acute gastritis syndrome**

Treat Rest + Dietetic + Medical (See under chronic)

(B) SUBACUTE PEPTIC ULCER:

- Path (1) Persistence and extension of acute ulcer
 (2) Exacerbation on a chronic ulcer
- Clinic (a) Persistence of subsiding acute ulcer signs
 or (b) Exacerbation on chronic ulcer signs

(C) CHRONIC PEPTIC ULCER

- Eti (1) Age (a) Gastric ulcer young (15-25)
 (b) Duodenal ulcer middle (30-50)
- (2) Sex (a) Gastric ulcer females > males
 (b) Duodenal ulcer males > females
- (3) Family history of hyperchlorhydria
 ulcer
 carcinoma
- (4) Diet: (a) Spices and hot food
 (b) Tobacco, betel nut
 (c) Avitaminosis A, D and C
- (5) Gastritis; Chronic hypertrophic
- (6) Anxiety and mental stress
- Path An acute peptic ulcer made chronic by:
- (1) Ulcer diathesis.
- (a) General.
- (a) Asthenic gastric ulcer
 (β) Sthenic duodenal ulcer
- (b) Local or gastric:
- (a) Altered gastric motility
- (1) Pyloric spasm + gastro stasis
 . Gastric ulcer
- (2) Hyper motility + rapid flow
 Duodenal ulcer
- (β) Hyper acidity
- (1) Congenital hyper secretion
 (2) Absence of bile regurgitation
- (2) Distant chronic septic focus:
- (a) Pyorrhea alveolaris
 (b) Chronic appendicitis

Causation theories

- (1) Ulcer diathesis
- (2) Neurogenic: Tobacco
 Mental strain
- (3) Acid and gastric motility factor
- (4) Chronic gastritis
- (5) Vascular septic thrombosis or embolism

Sites :

- (1) Stomach : (a) Pylorus : (α) Anterior wall
(β) Lesser curvature
(γ) Posterior wall
(b) Body
(c) Cardia
- (2) Duodenum : Within 1·5' from pyloric sphincter :
(a) Anterior wall
(b) Posterior wall

Theories of situation *

- (a) Ischaemia: Endarteritis
(b) Traumatism: Magenstrasse
(c) Lymphoid folliculitis

Morb anat

- (1) Complete breach of muscle coat in the floor
- (2) Fibrotic induration and puckering
- (3) Adhesions and lymphadenitis
- (4) Penetration into other organs
- (5) Association of gastric and duodenal ulcers

Clinic (A) Local examination :

- (1) **Pain :**

- (a) Epigastric or referred

- (b) Latent Period:

Varying directly with the distance from the cardia

- (a) Cardiac 5-10 min after food
(β) Body 10-30 min " "
(γ) Pylorus $\frac{1}{2}$ to 2 hrs " "
(δ) Duodenal $2\frac{1}{2}$ to 5 hrs " "

- (c) Influenced by

- (2) Food

- (1) Worsens gastric pain

- (2) Relieves duodenal pain

- (β) Alkalis relief of pain

- (2) **Vomiting:** Marked in gastric ulcer

due to (a) Gastritis

(b) Pyloric obstruction

nature (1) *Hymenemesis*

In gastric ulcer

- (2) Water brush:

In duodenal ulcer

- (3) **Appetite:**

- (p) Good but afraid to eat, gastric

- (b) Good and relief by food + duodenal

- (4) **Local tenderness :** Transpyloric
 - (a) Left of midline gastric
 - (b) Right of midline duodenal
- (B) **General examination :**
 - (1) **Ulcer diathesis**
 - (a) Asthenic gastric
 - (b) Sthenic duodenal
 - (2) **Weight**
 - (a) Loss in gastric
 - (b) Gain in duodenal
 - (3) **Distant septic focus :** Teeth appendix
- (C) **Special examination :**
 - (1) **Test meal :**
 - (a) Total nearer the ulcer to the pylorus and beyond, higher the total acidity
 - (b) Fractional absence of gradual fall in the acidity curve
 - (2) **Barium meal :**
 - (a) Direct niche, notch, crater, deformity
 - (b) Indirect
 - (a) Gastric shape and tonus
 - (β) Hyper or hypo motility
 - (1) Stasis or rapid emptying
 - (i) Gastric ulcer
 - (a) Hypotonic
 - (b) Hypomotile
 - (c) Static
 - (ii) Duodenal ulcer
 - (a) Hypertonic
 - (b) Hypermotile
 - (c) Rapid emptying
 - (3) **Occult blood •**
 - (a) Gastric contents or vomit
 - (b) Stools
- (D) **Excluding examination exclude**
 - (1) Simple gastritis or hyperchlorhydria
 - (2) Reflex dyspepsia
 - (a) Pyorrhea alveolaris
 - (b) Chronic appendicitis
 - (c) Chronic colitis
 - (d) Chronic cholecystitis
 - (e) Chronic pancreatitis
 - (f) Chronic hepatitis
 - (3) Heart conditions angina
 - (4) Spine TB
 - (5) Specific diseases syphilis

- (6) Metabolic diseases - uræmia
- (7) Blood diseases - pernicious anæmia
- (8) Nervous diseases - tabes dorsalis

Diagnosis *Special diagnostic feature*

: **Seasonal periodicity :**

- Etiology** (a) Nervous or mental strain
(b) Indiscretion in diet

Path Intermittent exacerbation
of ulcer or concomitant gastritis

- Clinic** (1) Marked in duodenal ulcer
(2) Absent in complications
(a) Chronic perforation
(b) Adhesion
(c) Stenosis
(d) Carcinoma

Diff diag (A) **Local gastro duodenal conditions :**

- (a) Organic
 - (1) Gastritis and duodenitis
? pyorrhea alveolaris
 - (2) Syphilis and T B stomach
 - (3) Carcinoma stomach
 - (4) Duodenal diverticula, ileus, bands
 - (5) Gastro ptosis
- (b) Functional
 - (1) Pylorospasm
 - (2) Nervous
 - (3) Tabetic
 - (4) Migraine

(B) **Reflex surgical dyspepsias -**

- { (a) No relation with food
- { (b) No intermissions
- { (c) Associated other signs
- (1) Appendicitis - tender Mc Burney
- (2) Cholecystitis - five fs.
- (3) Pancreatitis - stool examination
- (4) Carcinoma colon - barium enema
- (5) Ilio-cæcal T B - rt iliac tumour
- (6) Visceroptosis - X Rays
- (7) Epigastric hernia - pain on posture

(C) **Neighbouring conditions : Referred**

- (1) Oesophagus
- (2) Heart
- (3) Diaphragm - hernia
- (4) Spine

(D) **General conditions : Medical**

- (1) Blood diseases - pernicious anæmia
- (2) Metabolic diseases - uræmia

- (3) Specific diseases . syphilis
 (4) Nervous diseases tabes
- complications (1) **Perforation :**
 (A) **Intra peritoneal :**
 (α) **Acute :** General peritonitis
 (β) **Subacute :** Perigastric abscess
 (c) **Chronic :**
 (α) Internal fistulæ
 (β) Penetration into neighbours
 (B) **Extra peritoneal :**
 Retro peritoneal cellulitis
 In posterior duodenal ulcers
- (2) **Hæmatemesis .**
 (A) Acute
 (B) Chronic and recurrent
- (3) **Stenosis :**
 (A) Cardiac dysphagia
 (B) Body hourglass
 (C) Pyloric gastric obstruction
- (4) **Perigastritis with adhesions .**
 Loss of periodicity
 Change in the character of symptoms
- (5) **Carcinoma :**
 In gastric ulcer
 Change in the character of symptoms
- (6) **Jaundice :**
 In duodenal ulcer
- Treatment (A) **Medical and dietetic treatment .**
 Ind (a) **Uncomplicated cases**
 During first two years
 (b) **Fear of anastomotic ulcer .**
 (α) Short history
 + (β) Hyper chlorhydria marked
 + (γ) Gastric hypermotility
 + (δ) Sthenic diathesis
- Tech (1) **Rest in bed with mental rest .**
 In acute and subacute phase
 (2) **Removal of septic foci**
 (3) **Antacids and neutralisers .**
 (α) Alternate powders of
 (α) Neutralon belladonna
 one teaspoon
 & (β) Four carbonates
 Mag carb
 Bism carb
 Calc. carb
 Soda bi-carb } \overline{aa} grs. xx

- (b) Magsorbent
- (c) *Aludrox*
Colloid aluminium hydroxide
- (d) Plenty of butter and olive oil

Complications of antacids and alkalis :

- (1) Rebound acidity
Mag oxide and carbonate
Soda bi-carb
- (2) Diarrhea
Mag oxide and carbonate
- (3) Constipation
Calcium carbonate
- (4) Alkalosis
Etiol Soda bi-carb
- Clinic (1) Obstinate constipation
- (2) Anorexia → nausea → vomiting
Headache → irritability
Flushing → perspiration
Aching → weakness of muscles
Tetany → convulsions → coma

- Signs (1) Urine alkaline
- (2) Blood increase in alkali reserve

- Treat (1) Stop alkalis
- (2) R Ammon. chlor grs. xx T D S.
or R Acid sod. phosph. grs. xxx T D S

(4) Diet : Sippy

- Points (A) Milk neutralises approximately its own value of gastric juice
- (B) Fats diminish the amount of gastric secretion

- Tech (1) Small feeds every alternate hour
(a) Milk ounces v
+ (b) Soda citras grs. x
- (2) Big feeds T D S
(a) Milk ounce xxxv
+ (b) Cream ounces v
+ (c) Soda citras grs. 120

- (3) Allow
Arrow-root
Barley, *butter* Bemax
Custard cream cod liver oil
Fruit
Marmite
Glucose orange juice

- (4) Avoid :
: Alcohol, spices, tobacco

- (5) Injections of .
 - . **Histidine or Larostidine**
 - . Daily intramuscular injection of 5 c c. of 4% sol for three weeks

(B) Surgical treatment :

Ind. (1) Failure of medical treatment for two years

- (2) Frequent relapses . more than six
- (3) Disappearance of periodicity
- (4) Change in the character of symptoms
- (5) **Appearance of complications :**
 - (a) Perforation
 - (b) Hæmatemesis recurrent
 - (c) Stenosis . pyloric or hour glass
 - (d) Perigastric adhesions
 - (e) Suspicion of malignancy
 - (f) Large ulcer as shown by X Rays

Tech (1) Gastric ulcer :

- (1) Pyloric exclusion + (4)
- or (2) Balfour's cautery + (4)
- or (3) Walton's wedge resection + (4)
- (4) **Gastro-jejunostomy**
- (5) Sleeve resection
- (6) **Partial gastrectomy**
- (7) Jejunostomy
- For high large ulcers
- (8) Cholecyst gastrostomy

(II) Duodenal ulcer :

- (1) **Gastro-jejunostomy**
- (2) Pyloric exclusion + (1)
- Finsterer's R z A
- (3) **Partial duodeno gastrectomy**
- (4) **Gastro duodenostomy**

Choice of operations in chronic gastro duodenal ulcers .

(A) Chronic gastric ulcer

(1) Body of the stomach

- (a) Small lesser curve ulcers
 - (α) Normal acid curve
 - Local excision + gastro jejunostomy
 - (β) High acid curve
 - Partial gastrectomy
- (b) Letter box ulcer near cardia .
 - (α) Gastro jejunostomy
 - (β) Jejunostomy

- (c) Large ulcer of the body
 - (a) Partial gastrectomy Operation of choice
 - (β) Jejunostomy
- (2) Pyloric ulcers
 - (a) Gastro-duodenal resection
 - (b) Gastro-jejunostomy
- (B) Chronic duodenal ulcer
 - (1) Duodenal ulcer with stenosis
 - Gastro-jejunostomy Operation of choice
 - (2) Duodenal ulcer without stenosis
 - (a) Pyloroplasty small lesions
 - (α) Horsley small anterior ulcer
 - (β) Judd small ulcer + mobile pylorus
 - (b) Gastro-duodenostomy high acidity
 - (α) Finney
 - (β) Jabouley
 - (c) Gastro jejunostomy
 - + (α) Infolding
 - (β) Excision
 - (γ) Cauterisation
 - (d) Partial gastrectomy Operation of choice

Common suitable operations for gastro duodenal ulcers

- (1) *Chronic gastric ulcer partial gastrectomy*
- (2) *Chronic duodenal ulcer*
 - (a) *Without stenosis partial gastrectomy*
 - (b) *With stenosis gastro jejunostomy*
- (C) Complications of gastro-duodenal ulcers
 - (1) Perforation
 - (a) Simple closure (α) Without drainage
 - (β) With drainage
 - (b) Closure + gastro-jejunostomy
 - (c) Partial gastrectomy ?
 - (2) Haemorrhage
 - (a) Blood transfusion + diet
 - ↓ (b) Infolding + pyloric exclusion + gastro-jejunostomy
 - or (c) Partial gastrectomy
 - (3) Hour-glass stomach
 - Partial gastrectomy
 - (4) Pyloric stenosis
 - (a) Gastro jejunostomy
 - or (b) Partial gastrectomy
 - (5) Malignant degeneration
 - Extensive resection with lymphatic area
 - (6) Gastro-colic fistula
 - Wilkie's two-stage operation
 - (a) Exclusion of involved colon
 - ↓ (b) Excision of fistula with partial gastrectomy

Complications of gastro-duodenal peptic ulcers :**(I) GASTRO-DUODENAL PERFORATION :**

Etio : Frequency : 10-15% of ulcers

Age and sex : Middle aged males

Previous history : In 80%

Site : 90% duodenal

: 90% anterior

: Intraperitoneal

*Clinical varieties .***(A) Acute perforation :**

Def : Extravasation of contents has access to general peritoneal cavity

Clinic : (1) **Stage of premonition :** (*Present or absent*)
: Exacerbation of symptoms of ulcer

↓ (2) **Stage of prostration :** *Abdominal collapse*

(a) Collapse with a vomit

(b) Intense epigastric pain

(c) Board-like rigidity

(d) Widespread tenderness

↓ (3) **Stage of reaction ;** *Period of illusion*

(a) No shock

(b) No pain


(c) Board like rigidity

↓ (4) **Stage of peritonitis :** *Acute abdomen*

↓ (5) **Stage of toxæmia :** *Paralytic ileus*

Special signs . (1) **Board-like tender rigidity**

Epigastrium

R.I.F.  triangle of tenderness

P.R.

(2) *Slow pulse for eight hours*

(3) **Disappearance of liver dullness**

(4) Pneumo peritoneum . X Ray

(5) Silent abdomen

Differential diagnosis of acute gastro duodenal perforations :**(1) Medical conditions :**

(a) Digestive : gastritis, enteritis, colics

(b) Respiratory : inflammations

(c) Circulatory : (α) Angina

(β) Embolism

(d) Urinary : colics

(e) Nervous : crises

(2) **Surgical conditions :**(A) **Extra abdominal : Referred**

- (a) Spine
- (b) Acute testis
- (c) Kidney

(B) **Abdominal wall:**

Muscle inflammations

(C) **Intra abdominal :**

- (a) Acute exacerbation of ulcer
- (b) *Acute appendicitis*
- (c) Acute cholecystitis
- (d) *Acute pancreatitis*
- (e) *Acute peritonitis*
- (f) Acute intestinal obstruction
- (g) Acute h moperitoneum

Treatment (1) **Immediate laparotomy : *Within six hours***↓ (2) **Exploration**↓ (3) **Treatment of the perforation :**(a) **Simple suture + omental graft :**

Ind Operation of choice

(b) **Suture + gastro jejunostomy :**

- Ind (1) Patient in good condition
 (2) Good surgeon
 (3) Good anaesthesia
 (4) Recent perforation
 (5) Closure → obstruction

(c) **Suture + pyloroplasty**

Ind Suture → obstruction

(d) **Wedge resection**(e) **Partial gastro duodenal resection**

Ind As in (b)

(f) **Temporary gastro or duodeno stomy**

Syn Braun's operation

Ind Suture not possible due to induration

↓ (4) **Peritoneal toilet : (a) Dry
(b) Wet**↓ (5) **Closure : (a) *Without drainage if early*
(b) *With drainage***Post-compl (1) **Within 48 hours :**

- (a) Shock
- (b) *Acute gastric dilatation*

(2) **Within one week :**

- (a) Parotitis
- (b) *Chest complications*
- (c) *Peritonitis*

(3) **Within three weeks :**(a) *Wound sepsis*(b) *Residual abscess* sub phrenic
 pelvic(c) *Pylephlebitis*(4) **Sequelæ :**(a) *Recurrence of symptoms*(α) *Original ulcer*(β) *Ulcer complications*(γ) *Anastomotic ulcer*(b) *Adhesive obstruction*(c) *Ventral hernia*

Causes of death

(1) *Time factor*(2) *Age factor*(3) **Pathology factor :**(a) **Contents of the stomach :**

At the time of perforation

(b) **Size of the perforation**(c) **Extent of extravasation :**

In peritoneal cavity

(B) **Sub-acute perforation :**Def Extravasation of contents has access to limited
(perigastric) region of the peritoneal cavity

Causes

(1) *Gastric ulcer*(a) **Empty stomach**(b) **Small size of the perforation**(c) *Posterior perforation*(d) *Regional adhesions*(2) *Duodenal ulcer*(a) *Regional adhesions*(b) *Extraperitoneal perforation*

Clinic

(1) *Subacute or acute perforation syndrome*↓ (2) **Subphrenic abscess syndrome**(a) **Active :** (α) *Acute upper peritonitis*(β) *Septic toxæmia*(b) **Passive :** (α) *No local signs*(β) *Septic toxæmia*(1) *Active fever*(2) *Passive*subnormal temp
wasting(c) **X-Ray :** *Elevated and fixed diaphragm*

Diff diag

From other causes of

(1) **Subphrenic abscess .**(α) *Duodenum*(b) *Gall bladder*

- (c) Liver
- (d) Pancreas
- (e) Appendix
- (f) Colon
- (2) Perinephric abscess
- (3) Liver infections :
 - Liver abscess
- (4) Chest inflammations :
 - Pleurisy, pneumonia
- Compl (a) Chest inflammations
- (b) Gastric or duodenal fistula
- Treat (1) Expectant :
 - Ind (a) Early subsiding cases
 - (b) Progressive localisation
 - (c) Poor risks
- (2) Operative
 - Ind (a) Acute signs with persistence
 - (b) Failure of conservatism
 - (c) Localised abscess
- Tech Open exploration → drainage
- Post. treat (a) Position of efficient drainage
- (b) Daily dressings
- (c) Sulphonamide etc.
- Post. compl (1) Peritonitis
- (2) Gastric or duodenal fistula
- (3) Chest inflammations

(C) Chronic perforation :

Def Erosion or perforation into an adherent solid or hollow organ

Clinic (1) Change in the character of symptoms :

- (a) Absence of periodicity
- (b) Constancy of pain
- (c) Radiation of pain

(2) Signs of internal fistulae

(1) Intraperitoneal perforations

- Eti (1) Gastric perforations
- (2) Anterior duodenal perforations

Clinic Peritonitis or intraperitoneal abscess
Gastro-colic fistula

(2) Extraperitoneal perforations

Eti Posterior duodenal perforations

Clinic (a) Retro-peritonitis
↓ (b) Duodenal fistula

(2) HÆMATEMESIS

- Causes (1) Cirrhosis liver : Most common
- (2) Gastric lesions :
 - (a) Acute gastric ulcer

(b) Chronic gastric ulcer :

(α) Hæmatemesis from a chronic gastric ulcer tends to recur especially after 40

(β) Simple gastro-enterostomy alone cannot stop massive gastric hæmorrhage. Direct attack on bleeding point is necessary

(c) Gastric carcinoma

(d) Gastrostaxis chlorotic young females

(e) Reflex gastritis appendicitis
acute sepsis

(f) Post operative : After gastric operations**(3) Blood diseases**

(4) Acute sepsis acute gastric erosions due to
septicæmic embolism

(5) Collective hæmatemesis :

Gastric collection of blood from

(a) Fracture skull base

(b) Operations on oropharynx

(c) Rupture of an aneurysm

Clinic (A) Acute hæmatemesis :

(a) Copious vomits of bright red blood

(b) General signs of hæmorrhage

(c) Blood examination

(α) R B Cs < 3000000

(β) Hæmoglobin $< 60\%$

(B) Chronic and recurrent hæmatemesis :

(a) Small, recurrent, coffee ground vomits

(b) Secondary anæmia

Signs (1) Severe hæmatemesis :

(a) Grave general condition

(b) R B Cs < 2000000

(c) Hæmoglobin $< 40\%$

(2) Moderate hæmatemesis :

(a) Border line general condition

(b) R.B Cs < 3000000

(c) Hæmoglobin $< 60\%$

(3) Trivial hæmatemesis :

(a) Good general condition

(b) Slight anæmia

(c) Occasional blood streaks in vomits

(4) Laboratory hæmatemesis :

Occult blood in vomit or gastric contents

Diff. diag : (A) Swallowed bleeding from :

- (1) Fracture skull
- (2) Oro pharynx
- (3) Respiratory passages
- (B) Œsophageal varices
- (C) Gastric lesions
- (D) Duodenal lesions
- (E) Ruptured aneurysm

Treat. (A) **Acute hæmatemesis :**

(a) *Immediate to 48 hours :*

: **Conservative treatment of bleeding**

(b) *Within 48 hours if condition becomes worse inspite of blood drip transfusion*

or (c) *48 hours to one week after cessation of acute hæmatemesis.*

: **Operative treatment of bleeding**

(B) **Moderate or recurrent massive hæmatemesis :**

(a) **Conservative treatment of bleeding**

↓ (b) **Operative treatment of :**

(α) **Bleeding**

+ (β) **Ulcer**

(C) **Chronic or recurrent small hæmatemesis :**
: **Operative treatment of ulcer**

(1) *Conservative treatment of hæmatemesis*

(A) **Absolute rest :** Physical
Physiological
: Psychological

(B) **Antishock :** Morphia
Low Fowler position (Bailey)

(C) **Drip blood transfusion :**

Ind : (a) Pulse rate > 120

(b) Blood pressure < 90 Hg

(c) Hæmoglobin < 40%

(D) **Blood coagulants :**

: Calcium chloride or gluconate

: Serum

: Hæmoplastin

: Coagulen-ciba

: Kapilin

(E) **Rectal and subcutaneous hydrotherapy**

(F) **Local treatment :**

(a) **External :** ice bag over epigastrium

(b) **Internal :**

(α) **Ice to suck**

(β) Drugs :

- (1) Adrenalin chloride 1 in 1000 :
: One drachm every hour
- (2) Tribasic mag. phosph
: In water
- (3) Four carbonates powder
Teaspoonful t.d.s
- (4) Ferri et ammon. citras .
: Grs 30 t.d.s.

(G) Diet

(a) Meulengracht - (Med. Ann. 1937)

6 a.m. Tea, white bread, butter

9 a.m. Oatmeal, milk, white bread, butter

1 p.m. : Omelette, fish, vegetables, potato, rice,

3 p.m. Cocoa

6 p.m. : White bread, butter, meat, cheese, tea

+ Alkaline powders

(b) Anderson -

: Lenzhartz diet + gelatin sol

(2) *Operative treatment of hæmatemesis :*

Ind : Hæmatemesis of chronic gastric ulcer

(a) Early view : Within 48 hours

If : (a) Drip blood transfusion

+ (β) Hæmoglobin 90%

(b) Late view : After 48 hours to one week

Preoper - (1) Antishock

(2) Drip blood transfusion

Anæsth. Local novocain infiltration

Tech : (1) Exploratory laparotomy

↓ (2) Treatment of focus

(A) Condition poor

(a) Ligatures under running gastro-duodenal art

(b) Intra-gastric or intra-duodenal cautery

(B) Condition bad

(a) Gastro jejunostomy

+ (1) *Ligature*

or Cautery

or Infolding

+ (2) Pyloric occlusion

(b) Gastro-duodenostomy.

+ (1) *Ligature*

or Cautery

or Infolding

(C) Condition good -

(1) Duodenal hæmorrhage.

- (a) Gastro-duodenal resection :
+ Duodenal occlusion
- (b) Finsterer's partial gastrectomy :
+ Pyloric occlusion
- (2) Gastric hæmorrhage :
(a) Partial gastrectomy
(b) Wedge resection
+ Gastro-jejunostomy

(3) PYLORIC OR DUODENAL STENOSIS :
: With chronic gastric dilatation

Etiology (A) Organic stenosis :

: Fibrosis, infiltration, pressure

(a) Gastric causes :

- (1) Chronic gastric or duodenal ulcer
- (2) Gastric carcinoma
- (3) Post burn fibrosis
- (4) Infantile hypertrophic stenosis

(b) Extra gastric causes :

- (1) Perigastric adhesions
- (2) Extra gastric malignancy :
(a) Gall bladder
(b) Pancreas
(c) Colon

(B) Functional stenosis : visceroptosis

- (1) Gastroptosis
- (2) Superior mesenteric ileus
- (3) Mobile kidney

(C) Reflex spasmodic stenosis :

- (1) Chronic peptic ulcer . no fibrosis
- (2) Appendicitis

Clinic : Mechanical obstruction + gastritis :

- (1) **Change in the character of ulcer symptoms :**
(a) Loss of periodicity
(b) Constancy of pain
- (2) Epigastric discomfort and tympanitis
- (3) Copious foul smelling vomits or eructations
- (4) Starvation + dehydration
- (5) Dilatation stomach with visible peristalsis
- (6) Pyloric tumour . in carcinoma

Signs (a) X-Rays : Barium meal

- (1) Hyper peristalsis with stasis
- (2) Large size of the stomach
- (3) Filling defect pyloric or duodenal

(b) Test-meal : Hypochlorhydria

- (1) Less acidity total and free
- (2) Occult blood . in ulcer or cancer

- (c) **Stomach contents or vomit :**
 (1) Recovery of food taken long back
 (2) Occult blood in ulcer or cancer
 (d) **Stools :** Occult blood
 (e) **Blood :** Alkalosis

Diff. diag	Between
	(1) Organic and functional or reflex causes
	(2) Simple and malignant causes
	(3) Gastro duodenal and extra gastroduodenal
	(A) Simple organic stenosis
	(1) Long intermittent history
	(2) Ulcer symptoms
	(B) Malignant stenosis
	(1) Short continuous history
	(2) Anorexia
	(3) Tumour
	(4) X Rays
	(C) Reflex stenosis
	Reaction to antispasmodics
Compl	(1) Dehydration
	(2) Chlorine deprivation
	(3) Uræmia
	(4) Tetany
Clinic	(a) Dyspnoea + cyanosis
	(b) Spasms of extremities
Treat	(a) Continuous gastric aspiration
	(b) Glucose saline
	(c) Parathyroid extract
	+ (d) Ca chloride $\frac{1}{2}$ gr intravenous
Treat	(A) Conservative :
	Ind Functional and reflex spasmodic
Tech	(1) Antispasmodics
	Atropine, belladonna
	<i>Ocimum, Eupaco</i>
	(2) Gastric lavage
	(3) Removal of irritative focus :
	Appendicectomy
	(B) Operative :
	Ind Organic stenosis
Preoper	(1) Stomach wash B D for some days
	(No soda bi-carb. sol)
	(2) Hydrochloric acid in small doses
	(Avoid alkalis)
	(3) Hydrotherapy glucose saline
By	(a) Mouth
	(b) Rectum
	(c) Subcutaneous
	(d) Intravenous
Upto	day

- (4) Blood transfusion
- (5) Starving and lavage
- (6) Pass and keep in Ryle's tube
- (7) Preliminary jejunostomy:
: In carcinoma or extensive ulcer

Anæsth. (a) Local + splanchnic
(b) Spinal
(c) Cyclopropane (general)

Tech: (A) **Simple Causes:**

- (1) Posterior gastro-jejunostomy
- (2) Gastro-duodenostomy

(B) **Malignancy:**

- (1) **Partial gastrectomy:**
: If operable
- (2) Gastro jejunostomy + Devine
: If inoperable

(C) **Perigastric lesion:**
: **Gastro-jejunostomy**

(4) HOUR-GLASS STOMACH:

- Causes (1) Congenital
(2) **Acquired:**
(A) **Intrinsic:**
(1) Chronic gastric saddle shape ulcer
(2) Carcinoma body
(3) Gastrojejunal ulcer
(4) Corrosive burns
(B) **Extrinsic:**
(1) Perigastric adhesions
(2) Perigastric malignancy
(3) Perigastric pressure
(C) Reflex spasmodic

Etio: Females between 50 and 70

Path: (1) Organic hour glass: unequal pouches
(2) Spasmodic hour glass: equal pouches: B
: Disappears after atropine

Clinic: (1) As in pyloric stenosis
(2) Gastric lavage after intubation:
(a) All the fluid cannot be recovered
(b) Recovery of fluid in two parts
(3) X Ray barium meal after antispasmodics

Treat: (A) **Conservative:**

- Ind. (a) Early simple cases
(b) Spastic hour glass

Treat. (1) Regular gastric lavage
(2) Antispasmodics: *Octinum*
: *Eupaco*

(3) Dieting

(B) Surgical:

Ind: (α) Organic cases

(b) Obstructive syndrome

Pre oper: As in pyloric stenosis

Tech : (1) Gastro-jejunoscopy :

. To proximal pouch

(2) **Gastrectomy:** partial

(3) Gastropasty

(4) Wedge resection

↓ Pyloric occlusion

↓ Gastro jejunostomy

(5) Gastro gastrostomy

(5) PERIGASTRITIS WITH ADHESIONS

Causes: (1) **Gastro-duodenal:** Ulcer, carcinoma

(2) Extra-gastroduodenal: Gall bladder

Colon

(3) **Post-peritonitic:** Subphrenic abscess

(4) Post-operative

Clinic: (a) History of:

(a) Gastroduodenal pathology

or (β) Extra gastroduodenal pathology

or (r) Previous abdominal sepsis

or (6) Previous abdominal operation

(b) Signs of gastric stasis and dilatation

or Change in the characters of ulcer symptoms

or jaundice in duodenal adhesions

(c) X-Rays

Special sign : Effect of posture on symptoms :

- : Symptoms worse in position which stretches the adhesions

Treat. (1) Short circuit - Gastro-jejunostomy

(2) Partial gastrectomy

(6) ULCER-CANCER

Etiol. 10-15%

Path. (1) Cancerous ulcer 5-10%

(2) Ulcerative cancer

Clinic. (A) Changes in the characters of ulcer signs:

(1) Long history

(2) Loss of periodicity

(3) More rapid recent progress

(4) Anorexia → cachexia

(5) **Pain :** Characters changed

(a) **Constant**

(b) Dull

(c) Unrelieved by alkalis

↓ (6) Symptoms of rapid pyloric stenosis

(B) Special signs :

- (1) X Rays
 - (a) Big ulcer > 2 cms.
 - (b) Greater curvature ulcer
- (2) Test meal
 - (a) Total acidity any
 - (b) Free HCl; absent
 - (c) Persistent occult blood
 - (d) Microscope growth cells
- (3) Naked eye appearance
Large ulcer with malignant degeneration in one part

- Diff diag
- (1) Ulcerative cancer
 - (a) Short history
 - (b) Rapid progress
 - (c) Malignant changes in all parts of the ulcer
 - (2) Cancerous ulcer
 - (a) Long history
 - (b) Change in the characters of symptoms
 - (c) Malignant changes only at a part of the large ulcer

Treat Partial gastrectomy with lymphatic area

(7) PANCREATITIS AND JAUNDICE

- Causes
- (1) Duodenal ulcer
 - (2) Periduodenal adhesions

Treat Cholecyst-enterostomy

(IV) NEW GROWTHS OF THE STOMACH:**(A) BENIGN**

- (1) Leiomyoma
- (2) Fibroma
- (3) Adenoma and adeno papilloma

(B) MALIGNANT**(1) SARCOMA**

Etio 1% of all gastric tumours

- Varieties
- (1) Intra-gastric submucous
 - (2) Extra-gastric subserous, pedunculated
 - (3) Diffuse infiltrative

- Path
- (a) Round celled
 - (b) Spindle celled
 - (c) Lympho-sarcoma
- Late metastases

- Treat
- (1) Deep X Rays
 - (2) Radium

(2) CARCINOMA STOMACH :

Etiology : (a) Frequency :

- (1) Commonest site for carcinoma
- (2) 30% of all male carcinomas
20% of all female carcinomas

(b) Age : 40 to 70

(c) Sex : Males : females :: 3 . 1

(d) Heredity

(e) Predisposers :

- (1) Errors in diet :
: Spices, hot food, tobacco
- (2) Achlorhydria : hereditary, familial
- (3) **Chronic gastritis : Atrophic**
- (4) Chronic gastric ulcer .
(a) Greater curvature
(b) Cardiac
(c) Pyloric
(d) Diameter > 2 cms.
- (5) Benign growths : adenoma

Path. variety : (1) **Primary gastric carcinoma**(2) **Ulcer-cancer :**

: Malignant degeneration of peptic ulcer

(3) **Secondary :**

: Involvement in perigastric cancer .

(a) Gall bladder

(b) Pancreas

(c) Colon

Macroscopic : (1) **Ulcerative :** Hard, friable, everted, large(2) **Proliferative :** Soft, friable, cauliflower(3) **Scirrhus :** Stenosis(4) **Diffuse infiltrative :** Leather bottle(5) **Colloid or mucoid**Microscopic : (a) **Spheroidal**

(b) Columnar (adeno carcinoma)

(c) Colloid

(d) Squamous celled : rare

Sites : (1) **Cardiac :**

: Oesophageal obstruction syndrome

(2) **Body :** Hour glass stomach syndrome(3) **Pyloric :** Pyloric stenosis syndrome(4) **Curvatures :** Gastric ulcer syndrome**Ulcer and cancer areas go together**Spread : (1) **Direct :**

(a) Stomach : along lesser curve

(b) Adhesions

(c) Adherent organ

- (2) **Lymphatic:** (a) Permeation
(b) Embolism
Glands: Coronary, subpyloric, suprapancreatic, biliary, celiac, superior mesenteric, hilar, para-aortic, thoracic duct, supra-clavicular.
- (3) **Vascular:** Liver, bones
- (4) **Trans-cœlomic:** (a) Douglas pouch
(b) Krukenberg
(c) Peritoneum
- (5) **Implantation:**
'Kiss' cancer on opposite wall
- (6) **Alimentary propulsion:** cancer rectum

Common sites for metastases

- (a) **Glands:** Left supraclaviculars
- (b) **Liver**
- (c) **Peritoneum:** Pelvis, omentum
- (d) **Umbilicus**

Clinical types.

- (1) *Gastric type:*
 - (A) **Cardiac:** Dysphagia with heart burn
 - (B) **Body:**
 - (1) **Acute:** (a) Hæmatemesis
(b) Acute dyspepsia
(c) Perforation
 - (2) **Chronic:** Dyspepsia with anorexia
 - (3) **Ulcer:** Change in the ulcer syndrome
 - (4) **Obstructive:** Rapid signs of obstruction
 - (5) **Tumour**
 - (C) **Pyloric:** Rapid pyloric obstruction
 - (D) **Diffuse:** Leather bottle stomach
Progressive diminution of capacity
- (2) *Regional type.*
 - (A) **Tumour:** (a) Enlarged glands
(b) Omental metastases
 - (B) **Fistulæ:** Gastro colic
 - (C) **Enlarged liver:** Liver secondaries
- (3) *Distant type:* Metastases
 - (A) Ascitis
 - (B) Ovarian tumours
 - (C) Douglas' pouch
 - (D) Umbilicus
 - (E) Supraclavicular adenopathy

(4) *General type :*

- (A) Anæmia + Dyspepsia + Cachexia
- (B) Jaundice

Diagnosis: (1) **History :**

- (A) Long : intermittent \rightarrow remittent
- (B) Short : (a) Non obstructive : anorexia
- (b) Obstructive

(2) **Physical examination :**

- (a) Tumour
- (b) Dilatation of stomach
- (c) Metastases . (a) P.R. or P.V.
- (b) Neck
- (c) Liver
- (d) Umbilicus

(3) **Special tests :**(A) **Barium meal :**

- (a) Irregular contour
- (b) Filling defect
- (c) Crater or niche
- (d) Gastric dilatation or contraction
- (e) Hypo motility
- (f) Gastric stasis

(B) **Test-meal :**

- (a) Primary carcinoma .
- : Hypo or a chlorhydria
- (b) Secondary carcinoma .
- : Any chlorhydria
- (c) Occult blood
- (d) Growth cells

(C) **Vomit examination :**

- (a) Stasis of food
- (b) Occult blood
- (c) Growth cells

(D) **Stools examination :**

- . Occult blood

(E) **Blood examination :**

- (a) Anæmia
- (b) Wassermann or Kahn

(4) **Therapeutic test :**

: *Failure of medical treatment for one month, of any acute recent dyspepsia, in a patient past middle age*

(5) **Gastroscopy :** By œsophagoscope or gastroscopce(6) **Laparotomy :**

- (a) After every available examination
- (b) Persistent dyspepsia + achlorhydria

Diff diag (A) **Dyspepsias :**(a) **Surgical :**

- (1) Gastric
- (2) Duodenal
- (3) Gall bladder
- (4) Pancreas
- (5) Appendicular
- (6) Intestinal obstruction

(b) **Medical :**

- (1) Visceroptosis
- (2) Liver inefficiency
- (3) Chronic pancreatic inefficiency
- (4) Uræmia
- (5) Nervous

(B) **Gastric foci :**

- (1) Chronic gastritis
- (2) Chronic peptic ulcer
- (3) Achlorhydria
- (4) Gastric obstructions

(C) **Abdominal foci :**

- (1) Primary gastric from perigastric carcinoma
- (2) Secondaries diagnosis of the primary

(D) **Distant foci :**

- (1) Diagnosis between primary affections and secondary metastases
- (2) Diagnosis of the primary focus of the secondary metastases

(E) **General diseases :**

- (1) Pernicious anemia
- (2) Phthisis
- (3) Wasting diseases diabetes
- (4) Neurasthenia
- (5) Thyrotoxicosis

Treat Operative unless contraindicated(A) **Operable cases :**

- Pre oper (a) Glucose saline infusions
 (b) Blood transfusions
 (c) Gastric lavage

- Tech (1) Laparotomy midline supra umbilical
 ↓ (2) Exploration (a) Stomach
 (b) Lymph glands
 (c) Adhesions
 (d) Omenta
 (e) Liver
 (f) Peritoneum
 (g) Pelvis

↓ (3) **Treatment of the focus :**
 (A) **Radical :**

(1) **Partial gastrectomy :**

- (a) Anterior Polya
- (a) Moynihan
- (β) Balfour
- (b) Posterior Polya
- (a) Finsterer
- (β) Lahey

(2) **Total gastrectomy :**
Moynihan

(B) **Palliative :**

- (1) **Gastrostomy**
- (2) **Jejunostomy**
- (3) **Gastro jejunostomy :**

- (a) Anterior
- (b) Posterior

- (4) **Exclusion of the growth**
- (a) Cutting the stomach across
- ↓ (b) Proximal gastro jejunostomy
- (5) **Excision of the local growth**

(B) **Inoperable cases :**

- Contraind
- (1) **Local :** (a) **High carcinoma**
 (b) **Adhesions**
 - (2) **Regional :** (a) **Para aortic glands**
 (b) **Liver metastases**
 - (3) **Distant :** (a) **Malignant peritonitis**
 (b) **Pelvic metastases**
 (c) **Supra claviculares +**
 - (4) **General :** (a) **Cachexia**
 (b) **Metabolic debility**

Treat **Relief of pain and obstruction :**

- (1) Diet fluid and nutritious
- (2) Medicines sedatives
 Luminal, omnopon, morphia
- (3) Gastric lavage
- (4) **Deep X-Ray therapy**

(V) **ACUTE CONDITIONS OF THE STOMACH :**

- (1) **TRAUMA** Rupture, wounds, burns, foreign bodies
- (2) **ACUTE PHLEGMONOUS GASTRITIS**

- Etio
- (a) Corrosives
 - (b) Alcoholism
 - (c) Chronic gastritis
 - (d) Gastric ulcer

Path Acute suppurative strepto-occid cellulitis of the stomach wall

- Clinic (a) Severe epigastric pain and burning
(b) Vomiting with hæmatemesis
- Diff diag (1) Intra peritoneal perforation
(2) Acute pancreatitis
(3) Acute cholecystitis
(4) Pneumonia
- Treat (1) Sulphonamide
↓ (2) Laparotomy
↓ Exteriorisation of the stomach
↓ Multiple incisions down to the mucosa
↓ Drainage of the lesser sac
↓ Jejunostomy
- (3) ACUTE GASTRIC ULCER (See under Peptic Ulcer)
- (4) ACUTE HÆMATEMESIS
(a) Oesophageal varix cirrhosis liver
(b) Acute gastric ulcer distant sepsis with septicæmia
(c) Gastric carcinoma
(d) Gastrostaxis chlorotic young women
- (5) ACUTE GASTRIC PERFORATION
(See under Peptic Ulcer)
- (6) ACUTE VOLVULUS OF THE STOMACH
Etiology Any age and sex
Clinic (A) Acute
(a) Acute pain
(b) Nausea with inability to vomit
(c) Acute dysphagia
(d) Ballooning of the stomach
(e) Stomach tube does not pass
(B) Chronic pyloric obstruction syndrome
(C) Intermittent
- Treat Exploration → Puncture → Aspirate → Untwist → Suture
- (7) ACUTE DILATATION OF THE STOMACH
Etiology (1) Post-operative :
(a) Abdominal
(α) Gastro-duodenal
(β) Biliary passages
(γ) Pelvic organs
(b) Genito urinary
(c) Extremities urgent amputations
(2) Traumatic :
(a) Abdominal epigastric
(b) Fractures
(3) Acute sepsis : Septicæmia, typhoid
(4) Spinal Fractures and diseases
(5) Viscerotropic Mesenteric ileus
(6) Child birth

- Theories (a) Pylorospasm
 (b) Excessive secretion
 (c) **Paralytic**
 (d) **Superior mesenteric arterial compression**

Path: Distension upto sup mesent arterial crossing

- Clinic (1) Initial
 (a) **Epigastric discomfort**
 (b) Visible gastric distension
 (c) Rising pulse rate
- ↓ (2) Incessant, recurrent, copious, **regurgitant vomits** (Brownish with sweet odour)
- ↓ (3) **Dehydration** with thirst and **shock**
- ↓ (4) **Acute distension** of the stomach
- ↓ (5) Heart and respiratory embarrassment

- Diff diag (A) **Of different causes of vomiting:**
- (1) Post anaesthetic
 - (2) Acidosis
 - (3) Acute peritonitis
 - (4) High intestinal obstruction
 - (5) Paralytic ileus
 - (6) Acute gastritis
 - (7) Metabolic uræmia
 - (8) Nervous raised intracranial pressure
- (B) **Of different causes of gastric dilatation:**
- (1) Pyloric stenosis
 - (2) Infantile pyloric hypertrophy
 - (3) Gastric carcinoma

Treat **Postural gastric drainage:**

- (1) **Prone Trendelenburg** posture
- (2) **Gastric suction drainage & lavage**

With **Ryle's tube**

- Via (a) **Nose**
 (b) **Mouth**

- Tech. (a) **Continuous**
 (b) **Intermittent**

For 36 hours after stomach has regained tone
 as shown by 'gastric mobility test'

- (3) Rectal, subcutaneous and intravenous
 . 500 c cs normal saline with glucose
- (4) Drugs pituitrin 1 c.c. every 3 hours
 . eserine $\frac{1}{100}$ gr

(8) **TABETIC CRISES OF STOMACH**

Etio **Tabes dorsalis**

- Clinic (a) **Acute gastric crises**
 (b) **Tabetic stigmata** pupils

Diff diag **Acute gastro-duodenal lesions**

(VI) CHRONIC CONDITIONS OF THE STOMACH:**(1) CHRONIC GASTRITIS.**

- Varieties** (A) **Dietetic**: Alcohol, spices
 (B) **Reflex**: Appendicitis, cholecystitis
 (C) **Organic**: In association with
 (a) Pyloric obstruction
 (b) Peptic ulcer
 (c) Gastric carcinoma
 (D) **Specific**:
 (a) Syphilitic.
 Dyspepsia in a syphilitic patient
 (b) T B
 (E) **Plastic**: Leather bottle stomach
- Varieties** (a) Local
 (b) General
- Causes** (a) Simple fibromatosis
 (b) Carcinomatous
- Clinic** Gradual decrease of gastric capacity
 ↓ Progressively smaller feeds
- Etio** (1) **Exogenous**: Mechanical local irritants
 (2) **Endogenous**: Toxic irritants
- Path** (a) **Hypertrophic** → hyperchlorhydria →
 Peptic ulcer
 (b) **Atrophic** → achlorhydria →
 (α) Pernicious anaemia
 (β) Carcinoma
 (c) Superficial
 (d) Post operative stomach
 After gastro jejunostomy
- Clinic** **Epigastric distress**:
 (a) Burning
 (b) Gnawing
 (c) Dull pain
- With** (1) Relation to food immediate to 3 hours
 (2) Response to alkaline treatment
- Diff diag** (1) *Gastro duodenal peptic ulcer*
 (2) Gastric carcinoma
 (3) Reflex gastritis
 (4) Medical gastritis
- Compl** (a) Peptic ulcer: In hypertrophic gastritis
 (b) Gastric carcinoma: In atrophic gastritis
- Treat** (1) Treat the etiology
 (2) Gastric sedatives and emollients

(2) GASTRIC FISTULA.**(A) External gastric fistula:**

Etio: (a) **Gastrostomy**

(b) **Carcinoma**

Clinic. Extravasation of gastric contents: **Acid**

Diff diag: (1) Duodenal fistula

(2) Biliary fistula

(3) Intestinal fistula

(4) Colon fistula

(5) Pancreatic fistula

Compl: Irritation, digestion and eczema of the skin

Treat: **Alkaline and emollient dressings:**

(a) Starch + egg albumen + olive oil

or (a) Zinc oxide ointment + castor oil

+ (b) Soda bi carb powder

(B) **Internal gastric fistulae.**

Varieties. (1) Gastro-colic

(2) Cholecysto gastric gastro biliary

(3) Gastro jejunal

Causes (1) Chronic ulcer

(2) Sepsis

(3) Tuberculosis

(4) Carcinoma

(5) Operations

of { (1) Stomach
(2) Gall bladder
(3) Colon

Path (a) Direct

(b) Indirect intervention of a walled cavity

Clinic (1) Signs of primary conditions ulcer, carcinoma

↓ (2) Signs of fistula Passage of contents both ways

(A) Gastro-colic

(a) Diarrhoea with undigested food

(b) Faecal vomits

(B) Gastro biliary biliary regurgitation

(3) Loss of nourishment inanition cachexia

(4) X Rays (a) Barium meal

(b) Barium enema

(c) Cholecystography

Compl (1) Inanition cachexia

(2) Sepsis with chronic toxæmia

Treat (A) **Conservative**

Ind (a) No distal obstruction

(b) Recent

(c) Inoperable

(d) Pre-operative

Tech (1) Keep the passage-contents

(a) Antiseptic

(b) Dry

(c) Small in quantity

(2) Lavage of the constituent organs

(B) **Operative**

Ind (a) Distal obstruction

(b) Failure of conservatism

(c) Operable

- Tech (A) Preliminary jejunostomy
 ↓ Excision of fistula
 ↓ Restitution of parts
 or (B) Partial gastro-colectomy
 ↓ Gastro enterostomy
 + Colo-colostomy
 or Ilio-sigmoidostomy

(3) GASTROPTOSIS

- Varieties (1) **Primary** : Visceroptotic
 (a) Congenital
 (b) Acquired
 (2) **Secondary** : To chronic gastric dilatation
- Clinic (1) **Dyspepsia** : With neurasthenia
 (2) **Decubitus** :
 (a) Virginal narrow subcostal angle
 'Drooping lily' build
 (b) Maternal protuberant lower abdomen
 in a multipara
- (3) **X-Rays** :
 (a) Lesser curvature below umbilicus
 (b) Hypomotility
 (c) Stasis
- Diff diag (1) Organic gastric lesions ulcer, carcinoma
 (2) Dyspepsias medical and surgical
 (3) Nervous diseases
- Compl (1) Gastritis
 (2) Superior mesenteric ileus
 (3) Unindicated, meddling surgery
- Treat (A) **Conservative** :
 Belt physiotherapy, tonics
 ↓ (B) **Operative**
 Gastro duodenostomy
 (No gastro-jejunostomy)

(4) GASTRIC VENTRAL HERNIA

- Def Inclusion of the stomach in
 (a) Median epigastric hernia
 (b) Umbilical hernia
 (c) Ventral hernia
- Clinic (1) **Dyspepsia** Associated with food
 (2) Posture factor
 Exaggeration of symptoms in recumbent position
 (3) **Hernia** Palpable or impalpable
- Treat Radical operation

(5) GASTRIC DIVERTICULA

- Etiol Rare
 Cause Penetrating ulcers

- Clinic (a) Gastric dyspepsia
 (b) X Rays Barium meal
 (1) Presence of barium at a constant place after emptying of the stomach
 (2) Demonstration of gastric barium contents beyond the limits of gastric outlines

(6) LYMPHO-GRANULOMA OF STOMACH

(B) THE DUODENUM

(1) CONGENITAL ABNORMALITIES

- (1) DUODENAL ATRESIA Persistent septum
 Site Level of ampulla
 Cause Junction of foregut and midgut

- Clinic Pyloric obstruction syndrome
 With (a) Vomiting from birth
 (b) Presence of bile in vomit
 (c) No palpable tumour

(2) DUODENAL DIVERTICULA

- Varieties (A) True Congenital
 (B) False Acquired

- (a) Ulcers
 (b) Bands and adhesions near the ampulla
 Sites (A) True weak spots along inner aspect
 (B) False Visceroptosis
 Associated (1) Chronic duodenal ileus
 (2) Latent

- Clinic (a) Latent
 or (b) Pressure syndrome

- (a) Duodenal obstruction syndrome
 (b) Bile ducts jaundice
 + (c) X Rays barium meal

- Compl (1) Inflammation
 (2) Ulceration

- (3) Perforation
 (4) Haemorrhage

- Treat (a) Leave alone if latent
 (b) Pyloric occlusion + gastro jejunostomy
 (c) Excision \rightarrow invagination of the stump

(3) DUODENAL BANDS

- Varieties (A) Congenital Hepatico-duodenal fold
 (B) Acquired inflammatory (Importance in cholecystectomy)
 Clinic (1) Latent
 (2) Pyloric obstruction syndrome
 (3) X Rays

(4) DUODENAL ILEUS

- (A) Acute gastro duodenal ileus
 (See acute dilatation of stomach)

(B) Chronic duodenal ileus :

Def : Distension of duodenum and pylorus with stasis

Etio : Visceroptosis

Causes : (1) Pressure of :

- | | |
|----------------------------------|-----------------------|
| (a) Root of the mesentery | } prolapsed
caecum |
| (b) Superior mesenteric vessels | |
| (c) Chronic inflammatory lesions | |
| (d) Congenital bands | |

(2) Angulation : due to visceroptosis

Association . **Visceroptosis**

- Clinic (a) Females with visceroptosis
 (b) 'Weak stomach' with 'bilious attacks'
 (c) Relief by rest and recumbency
 (d) X-Rays : '*writhing duodenum*'

Diff diag **From dyspepsias :**

- (1) Gastro-duodenal ulcer with stenosis
- (2) Appendicular dyspepsia
- (3) Cholecystitic dyspepsia
- (4) Pancreatic dyspepsia
- (5) Colonic dyspepsia

- Compl (a) Gastro-duodenal dilatation
 (b) Biliary and pancreatic infection

- Treat (1) **Conservative :**
 (a) Rest in bed with foot raised
 (b) Dieting
 (c) Physiotherapy and appliances
 (d) Gastric aspiration and lavage
 (2) **Operative :**
 (a) Duodeno-jejunostomy
 (b) **Cæcopexy :** In prolapsed caecum
 (No gastro-jejunostomy)

(II) TRAUMA :**RUPTURE DUODENUM.**

- Etio (a) Run-over accidents
 (b) Blows on epigastrium
 (c) Stab wounds

- Path (1) Intra-peritoneal :
 Acute perforative spreading peritonitis
 (2) Extra-peritoneal
 . Retroperitonitis
 (3) Combined or complete

- Clinic (a) Acute perforative peritonitis
 In intra-peritoneal rupture
 (b) Acute retro-peritonitis
 In extra-peritoneal rupture

Treat (1) Exploration

- Signs (a) Intra-peritoneal rupture
 . Peritonitis with biliary extravasation

- (b) Retro peritoneal rupture
 (a) Haemorrhagic extravasation
 (3) Haemorrhagic petechiae
 (v) Fat necrosis
 + (2) Suture of the rupture
 + (3) Gastro jejunostomy if required
 + (4) Drainage of periduodenal space
 or (?) Closure of both duodenal ends } in complete rupture
 + (3) Gastro jejunostomy
 Post. compl Duodenal fistula

(III) INFLAMMATION

(1) CHRONIC DUODENITIS

- Inc (a) Duodenal ulcer syndrome
 (b) Achlorhydria
 Diag Peptic ulcer

DUODENAL ULCER

- 'A' Acute duodenal ulcer
 syn Curling's ulcer
 tio Extensive burns
 te Second part opposite ampulla
 path Toxic—(Excretion via common bile duct)
 Clinic (1) Presence of extensive burns or acute toxæmia
 (2) Haematemesis or melæna
 Treat Conservative
 (B) Chronic duodenal peptic ulcer
 (See under Stomach)

(IV) DUODENAL FISTULA

(1) EXTERNAL DUODENAL FISTULA

- Causes (1) Post operative Operations on
 (a) Gall bladder and biliary ducts
 (b) Duodenum
 (c) Kidney
 (2) Trauma Rupture
 (3) Perforation

- Clinic (a) History
 (b) Position of the stoma right upper abdomen
 (c) Discharge Alkaline yellowish irritating
 (d) X Rays

- Diff diag (1) Gastric fistula Acid colourless
 (2) Gall bladder fistula Alkaline
 (3) Jejunal fistula Biliary or mucous
 (4) Faecal fistula Colon
 (5) Umbilical fistula

- Compl (a) Irritant dermatitis
 (b) Starvation cachexia

Treat (1) Conservative :

- (a) Restriction of fluids and diet
- (b) Protection of skin
 - (a) Zinc oxide + castor oil
 - (β) 30% calomel in lanolin
 - (γ) Paste of kaolin and water
- (c) Suction drain continuous
- (d) Indwelling Einhorn tube

(2) Operative :

- (a) Closure if after gastrectomy
- (b) Pyloric exclusion :
+ Gastro jejunostomy
- (c) Jejunostomy

(2) INTERNAL DUODENAL FISTULA

Syn Natural duodeno-cholecystostomy

Etio (a) Operative

(b) Traumatic

(c) Inflammatory Gall stones

(d) Carcinoma

(a) Gall bladder

(β) Hepatic flexure duodeno-colic

Clinic (1) Duodeno-cholecystic

Latent

(2) Duodeno-colic

Passage of undigested food per anum

Treat (1) Duodeno-cholecystic

Leave alone

(2) Duodeno-colic

Gastro-jejunostomy + Ileo transverse colostomy

(V) NEW GROWTHS •

(1) INNOCENT All rare

Varieties (a) Adenoma

(b) Myoma

(c) Fibroma

(d) Lipoma

Clinic (1) Vague abdominal symptoms

(2) Peptic ulcer syndrome

(3) Pyloric stenosis syndrome

(4) Biliary obstruction syndrome

Treat Excision + gastro jejunostomy

(2) MALIGNANT Carcinoma rare

Sites (1) Peri-ampullary

(2) Infra-ampullary

(3) Supra ampullary

Path (A) Cylindrical-celled ad

Brunner's glands

(B) Spread (a)

(b)

- Clinic** (1) **Supra-ampullary** Very rare
Pyloric obstruction syndrome
- (2) **Peri-ampullary**
Pancreatic carcinoma syndrome
(a) Persistent progressive jaundice
(b) Enlarged gall bladder and liver
(c) Biliary sepsis
(d) Cachexia
- (3) **Infra ampullary**
Duodenal ileus syndrome
(a) Bilious vomits
(b) Gastro-duodenal dilatation
(c) Cachexia
- Diag** X Rays barium meal duodenal filling defect
- Treat** (A) Inoperable
(a) Gastro jejunostomy
+ (b) Cholecyst-gastrostomy
(B) Operable Excision + anastomosis
- Post compl** (1) Jaundice
(2) Duodenal fistula

(C) GASTRO-DUODENAL OPERATIONS

1) PRE-OPERATIVE CONSIDERATIONS:

- (1) **BEST TIME TO OPERATE**
(A) Operations of urgency immediate
(B) Operations of choice after a period of preparation
- (2) **Pre operative preparation :**
(A) **Hygiene of the mouth :**
(a) Removal of septic foci
(b) Frequent gargles
(B) **Medical treatment** Of gastro duodenal focus
(a) Alkaline powders
(b) Olive oil, belladonna
(C) **Diet:** Sippy, nutritious liquid diet
(D) **Intestinal precautions :**
(a) Laxatives
(b) Intestinal antiseptics
(E) **Respiratory precautions :**
Prophylactic anti pneumonic treatment
Anticatarrhal vaccine
Deep breathing exercises
(F) **Urinary precautions :**
(a) Hydrotherapy
(b) Urinary antiseptics and diuretics

Treat (1) **Conservative :**

- (a) Restriction of fluids and diet
- (b) Protection of skin
 - (1) Zinc oxide + castor oil
 - (2) 30% calomel in lanolin
 - (3) Paste of kaolin and water
- (c) Suction drain : continuous
- (d) Indwelling Einhorn tube

(2) **Operative :**

- (a) Closure if after gastrectomy
- (b) Pyloric exclusion :
+ Gastro-jejunostomy
- (c) Jejunostomy

(2) **INTERNAL DUODENAL FISTULA**

Syn Natural duodeno-cholecystostomy

Etiol (a) Operative

(b) Traumatic

(c) Inflammatory Gall stones

(d) Carcinoma

(a) Gall bladder

(2) Hepatic flexure duodeno-colic

Clinic (1) Duodeno-cholecystic

Latent

(2) Duodeno-colic

Passage of undigested food per anum

Treat (1) Duodeno-cholecystic

Leave alone

(2) Duodeno-colic

Gastro-jejunostomy + Ileo transverse colectomy

(V) **NEW GROWTHS :**(1) **INNOCENT** All rare

Varieties (a) Adenoma

(b) Myoma

(c) Fibroma

(d) Lipoma

Clinic (1) Vague abdominal symptoms

(2) Peptic ulcer syndrome

(3) Pyloric stenosis syndrome

(4) Biliary obstruction syndrome jaundice

Treat Excision + gastro jejunostomy

(2) **MALIGNANT** Carcinoma rare

Sites (1) Peri-ampullary

(2) Infra-ampullary

(3) Supra ampullary

Path (A) Cylindrical-celled adeno-carcinoma from mucosal
Brunner's glands

(B) Spread (a) Along the lumen

(b) Around the lumen obstruction

- Clinic (1) Supra-ampullary Very rare
 • Pyloric obstruction syndrome
- (2) Peri ampullary
Pancreatic carcinoma syndrome
 (a) Persistent progressive jaundice
 (b) Enlarged gall bladder and liver
 (c) Biliary sepsis
 (d) Cachexia
- (3) Intra-ampullary
 Duodenal ileus syndrome
 (a) Bilious vomits
 (b) Gastro-duodenal dilatation
 (c) Cachexia
- Diag X-Rays barium meal duodenal filling defect
- Treat (A) Inoperable
 (a) Gastro jejunostomy
 + (b) Cholecyst-gastrostomy
 (B) Operable Excision + anastomosis
- Post. compl (1) Jaundice
 (2) Duodenal fistula

(C) GASTRO DUODENAL OPERATIONS

(I) PRE-OPERATIVE CONSIDERATIONS:

(1) BEST TIME TO OPERATE

- (A) Operations of urgency immediate
 (B) Operations of choice after a period of preparation

(2) Pre-operative preparation:

(A) Hygiene of the mouth:

- (a) Removal of septic foci
 (b) Frequent gargles

(B) Medical treatment: Of gastro duodenal focus

- (a) Alkaline powders
 (b) Olive oil, belladonna

(C) Diet: Sippy, nutritious liquid diet

(D) Intestinal precautions:

- (a) Laxatives
 (b) Intestinal antiseptics

(E) Respiratory precautions:

- Prophylactic anti pneumonic treatment
 Anticatarrhal vaccine
 Deep breathing exercises

(F) Urinary precautions:

- (a) Hydrotherapy
 (b) Urinary antiseptics and diuretics

- (G) **Circulatory precautions :**
- (a) Blood coagulants
 - (b) Hæmatinic tonics
 - (c) Blood transfusion
- (H) **Metabolic precautions : Hydro glucose therapy**
- (a) Fluids.
 - (α) Mouth : ad lib.
 - (β) Rectum : Murphy
 - (γ) Intravenous 5000 c.cs. in 24 hours
 - (b) Glucose :
 - (α) Mouth : 200 c.cs. of 10% glucose in 1% sodium chloride sol. T.D.S.
 - (β) Intravenous : 25 c.cs. of 20% glucose B.D.
- (3) **Special investigations :**
- (A) **Gastric test meal**
 - (B) **X-Rays :** Barium meal
 - (C) **Blood :**
 - (a) Cell count and hæmoglobin
 - (b) Blood sugar
 - (c) Blood urea
 - (d) Wassermann
 - (e) Coagulation and bleeding time
 - (D) **Heart and circulation :**
 - (a) Heart
 - (b) Blood pressure
 - (E) **Stools examination**
 - (F) **Urine examination**
 - (G) **Rectal examination**
- (4) **Special steps :**
- (A) **Gastric lavage :** Obstructive lesions
 - (B) **Gastric aspiration :**
 - (a) Obstructive lesions
 - (b) General anæsthesia
 - (c) Pronounced vomiting
 - (C) **Medicines :**
 - (a) Alkalies. in hyperchlorhydria
 - (b) Hcl : in achlorhydria
 - (D) Avoidance of soda bi-carb }
 + Supply of chlorides : } . in pronounced vomiting
 - (a) Hcl. by mouth
 - (b) Hypertonic saline
 - (E) **Anti shock measures :** if necessary

(5) Immediate pre-operative treatment :**(A) Stomach wash :**

Tech Ryle's tube

- Time (a) Previous evening
 (b) Three hours before operation
 (c) Immediately before and during operation
 If vomiting is pronounced
 Combine with suction drainage

(B) Hydro glucose therapy :

Time From previous evening

- Tech (a) Mouth sterile water sips
 (b) Rectum tap water
 (c) Venous glucose saline

(C) Diet precautions :

Nothing by mouth for three hours before operation

(D) Sedatives :

- (a) Hypnotic previous night
 (b) Omnopon $\frac{1}{2}$ gr one hour before
 (c) Morphia $\frac{1}{4}$ gr + atropine $\frac{1}{100}$ gr
 Half an hour before

(E) Skin preparation :

From clavicle to mid thighs

(F) Catheterisation . If necessary**(G) Ryle's tube**

For suction drainage of stomach just before,
 or/and, during the operation
 If necessary

(6) Anæsthesia :**(A) General**

- (B) Regional (a) Spinal
 (b) Field block + splanchnic

(C) Local + splanchnic**(II) OPERATIVE TECHNIQUE:****(1) Incisions**

- (a) Midline Exploration
 (b) Right paramedian Pyloro-duodenal lesions
 (c) Left paramedian body of the stomach lesions
 (d) Left subcostal cardiac end lesions
 (e) Right trans rectus
 (f) Left trans rectus
 (g) Transverse epigastric

(2) Ligatures

- (a) Intestines
 No 0-00 20 days chromic catgut

- (b) Omentum, gastric vessels and peritoneum :
No. 2: Chromic catgut
- (c) Muscles
No. 1-2 Chromic catgut
- (d) Skin Fine silk-worm gut
- (3) Needles
 - (a) (Souttar's atraumatic needle).
For viscera and peritoneum
 - (b) Round bodied
For extraperitoneal structures
 - (c) Cutting
For skin and subcutaneous tissues
- (4) Clamps :
 - (a) Payr clamps
 - (b) Sherrin clamps
 - (c) De Petz clamps
- Ind Thick, dilated stomach
- Contraind (a) Thin, friable, small stomach
- (b) Gastro duodenostomy
- (c) Œsophago jejunostomy
- (5) General exploration :
 - (a) Stomach and duodenum
 - (b) Liver and biliary apparatus
 - (c) Transverse colon and both flexures
 - (d) Spleen
 - (e) Pancreas
 - (f) Kidneys
 - (g) Appendix and Meckel
 - (h) Cæcum and ascending colon
 - (i) Small intestines
 - (j) Descending, sigmoid and pelvic colon
 - (k) Rectum
 - (l) Pelvic organs
 - (m) Ureters
- (6) Exploration of the focus :
 - (A) Chronic peptic ulcer :
 - (1) Adhesions fibrous, omental
 - (2) Puckering
 - (3) Opacity
 - (4) Roughness
 - (5) Induration without friability
 - (6) Red speckling
 - (7) Sentinel gland
 - (ii) Carcinoma :
 - (1) Nature of the growth .
Ulcer or tumour or scirrhus
 - (a) Large size
 - (b) Site : greater curvature
 - (c) Induration with friability

- (d) No red speckling
- (c) **Everted edges**
- (2) Adhesions to and **infiltration** into neighbours
- (3) Glandular involvement .
+ white infiltrated lymphatics
- (4) Secondary complications
: Obstruction, perforation
- (5) **Metastases :**
. Peritoneum, omentum, liver, pelvis, ovaries
- (7) **Determination of operability :**
 - (A) Local condition
 - (B) Regional condition
 - (C) Distant condition
 - (D) General condition :
 - (a) Present
 - (b) Future . till the end of the operation
- (8) **Determination of the nature of the operation :**
 - (A) Urgent relieving . suture of perforations
 - (B) Palliative : gastrostomy
: gastro enterostomy
 - (C) Radical : gastrectomy
- (9) **Operation itself**
- (10) **Closure :**
 - (a) **Never forget to count the abdominal mops before closing**
 - (b) Complete relaxation of abdominal wall is essential
 - (c) Additional factors in relaxation
 - (a) Flexion of thighs
 - (b) Deep breathing

(III) DIFFERENT GASTRO-DUODENAL OPERATIONS:

(1) GASTRIC ASPIRATION DRAINAGE .

Ind: (A) **Repeated vomiting :**

- (a) Intestinal obstruction
- (b) Peritonitis
- (c) Acute dilatation of stomach
- (d) Post operative vomiting

(B) **Gastric lavage**

Routes: (1) **Nasal**
(2) **Oral**

Tubes: (a) **Ryle's**
(b) **Levine's**
(c) **Bailey's**

Methods: (1) **Intermittent**
(2) **Continuous:**
(a) **Keep the tube in**

- (b) Removal after 'gastric mobility test'
- (c) Replacement whenever distension or retching occurs

Test 'Gastric mobility test'.

- (a) $\frac{1}{2}$ pint of coloured barley water to be drunk
- (b) Aspirate after $\frac{1}{2}$ an hour
- (c) Note the colour

- Drainage
- (1) Gravity evacuation
 - (2) Syringe aspiration
 - (3) Suction apparatus

(2) RAMSTEDT PYLOROPLASTY

Ind Congenital hypertrophic pyloric stenosis

Time Not too late

- Pre-oper
- (a) Regular gastric lavage with sterile saline
 - (b) Subcutaneous and rectal saline
 - (c) Blood transfusion 20 c cs. for each kilo of body weight
 - (d) Glucose-saline infusions
 - (e) Anti shock precautions
 - (f) Small frequent feeds

- Anæsth
- (1) General ether
 - (2) Local

- Tech
- (a) Gastric suction
 - (b) Incision (a) Midline
or (c) Right paramedian
 - (c) Isolation by packs
 - (d) Sphincter split
 - (a) Incis on on the anterior aspect of gastro-duodenal junction from duodenum towards pylorus
 - (b) Blunt separation of sphincter muscle fibres
Till muc mem. protrudes through
 - (c) Take care of the duodenum
 - (e) Compression of the stomach

- Post treat
- (1) Keep warm
 - (2) Diet 3 hour feeds
 - (a) Glucose 75% in saline drachm 1 \rightarrow ounces ii
 - (b) Milk with barley water and soda citras
 - (3) Hydrotherapy Dextrose-saline
 - (a) Mouth
 - (b) Rectum
 - (c) Veins

Compl (See under Hypertrophic pyloric stenosis)

(3) OPERATIONS FOR PEPTIC GASTRIC AND DUODENAL ULCERS

(1) PYLORIC EXCLUSION OR OCCLUSION

- Ind
- (1) Addition to gastro-jejunostomy
In non-obstructive cases
 - (2) Inoperable pyloric carcinoma

Tech (A) Ligature

(a) Kelling Mayo

Silk mattress sutures

(b) Wilms

Silk ligature → autoplasmic graft

(B) Crush and ligature Bier

Crush → silk ligature → infolding

(C) Division and closure Devine

(a) Division of stomach

↓ (b) Closure of pylorus

↓ (c) Proximal gastro jejunostomy

(D) Excision and closure Finsterer RzA

(a) Partial gastrectomy

↓ (b) Pyloric exclusion

(B) EXCISION OF GASTRIC ULCER

Ind Addition to gastro jejunostomy

In cases with normal acid curve

Tech (A) Caутery

Ind (a) Cardiac ulcer

(b) Posterior wall ulcer

(B) Wedge resection

Ind Lesser curve ulcer

(C) Sleeve resection

Ind (a) Saddle ulcer

(b) Gastric body ulcer

(D) Transgastric excision

Ind Posterior wall ulcer

+ Adherence to pancreas

Steps (1) Exposure and mobilisation of the ulcer

(2) Isolation of the ulcer area

By (a) Stomach clamps

(b) Packs

(3) Caутerisation or excision of

(a) The ulcer

(b) Ulcer bearing area

(4) Ligature of arteries veins and omenta

(5) Closure of the rent

(a) Purse-string

(b) Linear (a) Inner all coats

(3) Outer seromuscular

+ (6) Gastro jejunostomy

(C) PYLOROPLASTY GASTRO DUODENOSTOMY

Ind (1) Chronic juxta pyloric stenosing ulcer

With mobilisable duodenum

(2) Recurrent hæmatemesis

(3) Gastro jejunal or jejunal ulcer

(a) Preventive

(b) Curative

Contraind Extensive periduodenal adhesions,
With immobile duodenum

Tech (1) **Horst y Heineke Mikulicz Verticalisation**

Transformation into vertical of a transverse incision with its centre at the pylorus

(2) **Judd Pylorotomy + duodenoplasty**

(a) Mobilisation of duodenum

(b) Excision of

(α) Anterior $\frac{2}{3}$ ds of pyloric sphincter

(β) Cap of the duodenum

(γ) Ulcer and scar

(c) Anastomosis

(3) **Finney Side to-side gastro-duodenostomy**

(a) Mobilisation of pylorus and duodenum

(b) Three stay sutures

(c) Posterior sero muscular

(d) Horse-shoe incision

(e) Posterior all coats

(f) Anterior all coats

(g) Anterior sero muscular

(4) **Jaboulay Anterior gastro-duodenostomy**

Anastomosis of anterior wall of the stomach with the anterior wall of the mobilised duodenum, over the pylorus

(D) GASTRO-JEJUNOSTOMY

Ind (1) **Gastric and duodenal peptic ulcer :**

(a) Failure of medical treatment

(b) Onset of complications

(α) **Pyloric stenosis**

(β) Hour glass stomach

(γ) Chronic perforation

(δ) Recurrent hæmorrhage

+ (c) Absence of

(α) Hyper acidity

(β) Hyper mobility

(γ) Recent history

(2) **Gastro-duodenal obstructions :**

(a) Intra lumen new growths

(b) Muscular (α) Fibrous

(ρ) New growths

(c) Extragastric (α) Adhesions

(β) New growths

(3) **Carcinoma pylorus :**

(a) In addition to Polya

(b) Preliminary to gastrectomy

(c) Palliative

Effects: (1) **Relief of obstruction :**

- (a) Mechanical
- (b) Physiological

(2) *Relief of pain and spasm*

(3) *Neutralisation of hyperacidity*

(4) *Improvement of nutrition*

Varieties: (a) **Posterior no-loop isoperistaltic**

(b) *Anterior no loop*

(c) *Posterior long loop* } with entero

(d) *Anterior long loop* } anastomosis

(e) *Retrocolic anterior*

(f) *Roux Y*

Steps: *Of posterior no loop isoperistaltic.*

(1) *General exploration*

(2) *Gastro duodenal exploration*

(3) **Demonstration of the ulcer**

(4) *Withdrawal of transverse colon*

(5) *Incision of transverse mesocolon :*
: (Save middle colic artery)

(6) *Withdrawal of posterior gastric wall*

(7) **Clamping of posterior gastric wall :**

(a) **From curvature to curvature**

(b) **In line with cardiac right edge**

(8) *Exploration of duodeno jejunal flexure*

(9) **Clamping of jejunum**

(a) **4"-6" from the flexure**

(b) **Along the long axis**

(10) *Isolation and approximation (extra-abdominal) of clamped viscera*

(11) *Anchor sutures*

(12) *Posterior sero muscular sutures : 4"*

(13) *Opening :*

(a) *Gastric* } $\frac{1}{2}$ " from suture line

(b) *Jejunal* }

(Ligature gastric vessels separately)

(14) *Posterior all coats suture*

(15) *Anterior all coats suture*

(16) **Loosening of clamps ;** *Observe bleeding*

(17) *Anterior sero muscular sutures*

(18) *Suture mesocolic edge to the stomach :*
: $\frac{1}{2}$ " proximal to anastomosis

(19) *Return the viscera in the abdomen*

(20) *Closure*

(4) OPERATIONS FOR CARCINOMA STOMACH :

(A) PARTIAL GASTRECTOMY.

Ind : (1) **Chronic peptic ulcer :**

(a) *Pyloric*

- (b) Duodenal
 - (c) Anastomotic
 - (d) Jejunal
- With
 - (a) Hyperchlorhydria
 - (β) Hypermobility
 - (γ) Recent history
- (2) Hour glass stomach
- (3) Carcinoma stomach
- (4) Gastro colic fistula
- Extent
 - (a) Non malignant lesions
 - (a) Duodenum one inch
 - (β) Stomach
 - (1) Sleeve
 - or (2) Proximal healthy margin
 - or (3) Distal two thirds
 - (b) Malignant lesions
 - (a) Duodenum first part
 - (β) Stomach
 - (1) Whole of lesser curve
 - (2) Half of greater curve
 - (3) Ulcer bearing area
 - (γ) Omentum lesser and greater
 - (δ) Regional lymph glands
 - (1) Pyloric supra infra retro
 - (2) Coronary upper lower
 - (3) Paraesophageal right
 - (4) Gastro epiploic right
- Steps (A) Gastrectomy
 - Tech
 - (1) General exploration
 - (2) Gastro-duodenal exploration
 - (3) Opening into lesser sac
 - Through gastro colic omentum
 - (4) Division of posterior adhesions
 - Mobilisation of stomach
 - (5) Division of gastro colic omentum
 - Close to the colon
 - Ligature of gastro epiploic vessels
 - (6) Duodenal
 - (a) Mobilisation
 - (b) Division between clamps
 - (c) Closure of the distal stump
 - (7) Division of gastro hepatic omentum
 - (a) Ligature pyloric artery
 - (b) Division of upper border near liver
 - (c) Ligature coronary artery

- (8) Clamping of the stomach
Right margin of cardiac orifice
↓ Vertically down
- (9) Isolation and clamping of jejunal loop

(B) Anastomosis

- Varieties (1) **Billroth I** Schoemaker
End to end gastro duodenostomy
- (2) **Billroth II**
(a) Gastric & duodenal stump closure
↓ (b) Side to side gastro jejunostomy
- (3) **Polya**
End to side gastro jejunostomy

- Methods (1) **Billroth I**
(A) End to-end gastro-duodenostomy
(B) Schoemaker Special clamps
(a) Excision of
(α) First part of duodenum
(β) Pylorus
(γ) Whole lesser curve
(b) Reconstruction of lesser curve
(c) End to end anastomosis
- (C) **Haberer Finney**
(a) Closure of duodenal stump
(b) Anastomosis of stomach to anterior wall of duodenum
- (2) **Polya** End to-side gastro jejunostomy
(A) Anterior or ante-colic
Tech (1) **Polya Moynihan** Retro-peristaltic
(a) Short loop
(b) Afferent loop at greater curve
(2) **Polya Balfour** Iso-peristaltic
(a) Long loop 12" from flexure
(b) Afferent loop at lesser curve
(c) Anastomosis between loops
(3) **Polya Hofmeister** (Med. Ann 1910)
(a) Ante colic
(b) Closure of 2/3rd of gastric stoma
(c) No entero enterostomy
- Results (α) **Moynihan**
Pressure on colon
(β) **Balfour**
Stasis in loops
(γ) **Hofmeister**
No too rapid unloading
- (B) **Posterior or retro-colic**
Tech (1) **Polya proper**
Iso-peristaltic anastomosis of gastric stoma and jejunum

(2) Finsterer Spur

(a) Closure of upper half of gastric stoma

(b) Anastomosis of lower half of gastric stoma and proximal jejunum through mesocolic stoma

(3) Lahey No tension on suture line

(a) Incision of Treitz lig

(b) Transplantation of proximal jejunal loop above the mesocolon

(c) Anastomosis

Tech (1) Polya-Moynihan :

: Ante-colic, no loop, retro peristaltic

(a) Sero muscular suture between :

{ α Posterior wall of stomach{ β Jejunum

(b) Distal clamping of stomach

(c) Incision of

{ α Posterior wall of stomach{ β Jejunum

(d) Posterior all coats suture

(e) Division of anterior wall of stomach

(f) Anterior all-coats suture

(g) Anterior sero muscular suture

(2) Finsterer :

: Retro colic, long-loop, iso-peristaltic with spur

(a) Divide stomach between clamps

(b) Close upper half of gastric stoma

(c) Anastomosis

(1) Opening in the mesocolon

(2) Draw up long jejunal loop

(3) Suture of left margin of mesocolic opening to posterior gastric wall

(4) Stitch up proximal jejunum to upper closed part of gastric stoma

(5) Anastomose jejunum 6"—8" from flexure to the lower open part of gastric stoma
(Proximal part to upper angle)

(6) Suture of right margin of mesocolic opening to anterior gastric wall

(B) TOTAL GASTRECTOMY Moynihan

- Ind. (1) Leather bottle stomach
 (2) High and extensive malignancy
- Steps (1) Mobilisation of stomach
 (2) Distal division of stomach
 (3) Closure of duodenal stump
 (4) Œsophago-jejunostomy
 (5) Proximal division of stomach
- Difficulties (a) Great depth
 (b) Short proximal stump
 (c) Absence of serous coat in Œsophagus
 (d) Friability of Œsophageal wall
 (e) Tendency to retraction

(5) GASTROSTOMY

Def. Fistula between stomach and abdominal wall for the purpose of artificial feeding

- Ind. (1) **Dysphagia**: Due to diseases of
 (a) Mouth . carcinoma
 (b) Pharynx and larynx : carcinoma
 (c) Œsophagus ulcer, stenosis, carcinoma
 (d) Cardia carcinoma
 (2) Introduction of radium

- Varieties (A) Temporary serous coat lined
 (B) Permanent . palliative . mucous coat lined

- Best time (1) After inability to swallow solid food
 (2) Before extreme starvation

- Best site. (a) Away from pylorus
 (b) Away from primary focus : carcinoma
 (c) Midway between curvatures

(A) Temporary gastrostomy :

- (1) **Senn : Safety ink pot**
 (a) Local anæsthesia
 (b) Left rectus-split exposure
 (c) Withdrawal and isolation of stomach
 (d) Incision into the stomach
 (e) Insertion and anchoring of catheter
 (f) Series of burying purse-string catgut sero muscular sutures
 (g) Fixation of stomach to parietal peritoneum
 (h) Suture of the wound
 With tube emerging at the lower end

(2) Kader Ditch

Two vertical and parallel sero muscular folds of anterior gastric wall drawn together above and below the entrance of the tube

(3) Witzel Tunnel

Ind Small tubular stomach

Tech Burial of the tube in the groove of stomach wall for two inches from its entrance into the cavity folds of the wall being stitched over

(B) Permanent gastrostomy •

(1) Frank Subcutaneous cone

(a) Incision (a) Parallel to costal margin
or (β) Along linea semilunaris

(b) Withdrawal of a cone of ant gastric wall

(c) Suture around the cone base

(a) Parietal peritoneum

and (β) Post rectus sheath

(d) Transverse incision above the costal margin

(e) Drawing up and opening of the cone apex

(a) Subcutaneously

or (β) Trans rectus

(2) Janeway Gastric flap

Catheter lying in a newly constructed tube of an ant. gastric wall flap anchored to the rectus sheath and opened on the skin surface.

(6) DUODENO-JEJUNOSTOMY

Ind Chronic duodenal ileus

Due to pressure by sup mesent art

Tech (a) Mobilisation of third part of duodenum

(b) Lateral anastomosis of

(a) Duodenum

(β) Jejunum

Steps (1) Transverse incision over the duodenum through the mesocolon

(2) Mobilisation of duodenum

(3) Clamping of (a) Duodenum 3rd part

(b) Jejunum 7" from flexure

(4) Anastomosis Retro peristaltic

(5) Save (a) Right colic artery

(b) Sup mesent vein

(7) GASTRO-DUODENAL EMERGENCIES

(A) GASTRO-DUODENAL PERFORATION

Pre oper (a) Morphine + atropine

(b) Continuous intravenous saline

Anaesth (1) Local novocain infiltration

+ (2) Intravenous evipan

At the time of peritoneal incision

or (3) Spinal

Operation (1) Exploration

↓ (2) Suture

- ↓ (3) **Peritoneal toilet**
- ↓ (4) **Drainage**: Not required in early cases
 - (a) Local
 - (b) Suprapubic
- Steps: (1) **Incision**: (a) **Midline**
 - or (b) Right paramedian
 - : (a) Small . diagnostic
 - ↓ (β) Large: therapeutic
- (2) **Search**: For the perforation
 - (a) Incision of the peritoneum
 - (a) Escape of gas
 - (β) Escape of fluid
 - (b) **Diagnosis of site**:
 - (α) Spot from which fluid wells
 - (β) Follow increasing inflammation
 - (γ) Adhesions, induration, redness
 - (δ) **Inspect and palpate**:
 - (1) Anterior gastric surface
 - (2) Duodenum
 - (3) Whole of the lesser curve
 - (4) Posterior gastric surface
 - . Via gastro colic omentum
- (3) **Isolation of the area**:
 - By: (a) Clamps if possible
 - (b) Mops: Arranged all around
- (4) **Closure of the perforation**:
 - (a) Suture . No 1-2, 20 days catgut
 - (b) Needle: Round bodied eyeless
 - (c) Introduction: in healthy tissues
 - (d) Suture: (1) Interrupted mattress
 - (2) Purse string
- (5) **Free omental graft or plug**
- (6) **Look for other perforations**
- (7) **Peritoneal toilet**: Not very necessary
(H. Bailey)
 - (a) Electric suction
 - (b) Dry mopping
 - (c) Take particular care of:
 - (1) Subphrenic spaces
 - (2) Rutherford Morison's pouch
 - (3) Lesser sac
 - (4) Paracolic gutters . right

- (5) Right iliac fossa
- (6) Pelvis

(8) Drainage :

- Ind : (a) Doubtful cases
 (b) **Much extravasation**
 (c) Insufficient toilet
 (d) **Duration > 12 hours**

- Sites : (1) **Rutherford Morison's pouch**
 (2) Lumbar gutters
 (3) **Suprapubic**
 (4) Operation wound

Time : 48-72 hours

(B) GASTROTOMY.Ind : (1) **Foreign bodies :**

- (a) Nature, shape and size
- (b) Fear of perforation
- (c) Impaction with obstruction
- (d) **Stasis** for more than 48 hours

(2) Intra gastric treatment of ulcers :

- (a) Cautery
- (b) Ligation of vessels

(3) Dilatation of achalasia cardia

Steps : (a) Laparotomy

(b) Exploration of stomach : from outside

(c) Treatment of the focus : foreign body

- (1) Manipulation into an accessible part
- (2) Isolation by clamp and pads
- (3) Incision and withdrawal
- (4) Closure of the stomach : two layers
- (5) Closure of the wound

(IV) POST-OPERATIVE TREATMENT OF GASTRO-DUODENAL OPERATIONS :(1) **Position :**

- (a) High or low Fowler

+ (b) *Flexion of the hips*

(2) **Oral hygiene :**

- (a) Frequent gargles
- (b) Lemon to suck

(3) **Chest prophylaxis : Anti pneumonic treatment**

- (a) Co, or Tr. Benzoin Co inhalations or deep breaths
- (b) **A.S.A. :** Atropine sulph. 1/200 gr.
 Strych hydrochlor. 1/50 gr.
 Adrenaline hydrochlor. 10 min.

(c) Camphor in-oil or Transpulmin

(d) M. & B. 693

(C) Gastrostomy :

- Position (a) Lying down on back
 (b) Lying on right side
- Food Three ounces of peptonised milk every three hours
 Beaten egg yolk
 Strained orange, tomato or grape juice
 Glucose
 Iron mixture, Halibut liver oil, marmite
- Point Run down water through the tube after every feed

(7) Medicines :

- (a) For post operative complications . hiccough etc.
 (b) For primary conditions ulcer
 (c) For deficiencies Hcl in gastrectomy

(8) Rectum :

- (a) Flatus tube when and if required
 (b) Enema 4th morning → alternate days
 (c) Liquid paraffin from fifth night
 (d) Laxatives after tenth day

(9) Dressings :

(A) No tube : Dry dressings changed twice in 10 days

(B) Tube :

- (a) Prophylactic : Removal in 48 hours
 (b) Peritoneal drain : Removal in 72 hours
 If discharge daily shortening
- (c) Gastrostomy tube :
- (1) Removal after 10th day
 - ↓ (2) Daily removal → cleansing → re insertion
 - ↓ (3) Left out at night after one month
 - (4) Gastrostomy plug when required
 - (5) Condition of the stoma
 - (a) Contraction wear the plug
 - (b) Relaxation leave the plug out

(C) Dressings : (in gastrostomy)

Protection of surrounding skin by starch, egg albumen, zinc oxide, castor oil, sprinkling of soda bi-carb

(V) POST-OPERATIVE SPECIAL COMPLICATIONS OF GASTRO-DUODENAL SURGERY :**(1) HÆMORRHAGE HÆMATEMESIS**

Causes (a) Immediate

- (1) Suture line
- (2) Ulcer bed

(b) Late

- (1) Ulcer bed
- (2) Gastro-jejunitis

- (3) Gastro-jejunal ulcer
- (4) Carcinoma
- (5) Retrograde intussusception
- (6) Blood, liver, spleen disease

Treat: (A) Prophylactic:

- (a) Loosening the clamps after the second row of sutures has been inserted and waiting for a few moments to see if there is any bleeding point.
- (b) Ligation of gastric vessels in the incision separately

(B) Curative:

(a) Immediate: Conservative

- (1) Trendelenburg position
- (2) Morphia $\frac{1}{4}$ gr. repeated
- (3) Nothing by mouth; rectal saline
- (4) Coagulation therapy:
 - (a) Calcium gluconate 10 c.cs
: Intravenous every hour
: For three doses.
 - (b) Coagulen (Ciba)
Hæmoplastin
Sera.

(5) Drip blood transfusion

↓ (b) Gastric lavage:

: 2% soda-bi carb. in normal saline at 120° F. with adrenaline one drachm

↓ (c) Operative:

- Ind (1) Failure of conservative treatment
+ (2) Rising pulse rate
+ (3) General signs of hæmorrhage

Tch. (1) Re-exploration

↓ (2) Treatment of focus.

(a) Stoma

(b) Ulcer.

Steps (1) Under running the bleeding point

(2) Over-sewing the entire stoma

(3) Undoing and re-making the stoma

(4) Cauterisation or excision of ulcer

(2) VOMITING:

Causes: (1) Immediate: 24-48 hours

- (a) Anæsthesia
- (b) Acute dilatation of the stomach
- (c) Œdema of the stoma

(2) Intermediate: 7-10 days

(A) Vicious circle vomiting:

: Regurgitant vomit

Due to : (a) Abnormal stoma :

- (1) Situation
- (2) Size
- (3) Direction
- (4) Spur
- (5) Adhesions between walls

(b) Abnormal loop :

- (1) Length . too short or too long
- (2) Angulation
- (3) Torsion
- (4) Pressure : mesocolic contracture
- (5) Adhesions
- (6) Herniation

(c) Abnormal stomach : Atony

- (B) Peritonitis vomiting
- (C) Intestinal obstruction vomiting

(3) Late : Months or years after

- (a) New ulceration or recurrence of old ulcer
- (b) Anastomotic ulcer
- (c) Malignancy
- (d) Mesocolic contracture
- (e) Retrograde intussusception
- (f) Adhesions
- (g) Intestinal obstruction

Treat (A) Conservative : First 36 hours

- (1) Morphia . repeated
- (2) Nothing by mouth
- (3) Rectal : (a) Saline with glucose
- (b) Ox bile
- (c) Vomited material
- (4) Injections :
 - (a) Intravenous : saline with glucose
 - (b) Intramuscular : pitressin 4 hourly

↓ (B) Gastric aspiration with lavage :

: After 36 hours

By : Indwelling Ryle's tube

↓ (C) Operative : Failure of conservatism

- (1) Vomiting after Billroth I.
 - (a) Gastro jejunostomy
 - or (b) Witzel gastrostomy
- (2) Vomiting after gastro-duodenostomy
 - : Gastro-jejunostomy
- (3) Vomiting after Billroth II.
 - (a) Witzel gastrostomy
 - (b) Treatment of obstruction
 - (c) Loop entero-anastomosis
 - (d) Indwelling Ryle's tube

(4) Vomiting after posterior gastro-jejunostomy :

(a) Stomach tube into efferent loop :

(a) Nasal

(β) Gastrostomy :

Donovan's operation

(b) Undoing and re-anastomosis

(c) Loop entero-anastomosis

(d) Jejunostomy

(3) HICCOUGH :

Cause. Diaphragmatic irritation by :

(a) Gastric dilatation

(b) Gastric adhesions

(c) Basal pleurisy

Treat : (1) Drugs (a) Menthol in rect spirit .

: Saturated solution

: 10 min. every hour

(b) 1 in 1000 adrenaline :

: 10 min. in teaspoonful of water

: Every hour

(c) Hypodermic cocaine 1/10 grain

(2) Co_2 inhalations

(4) ANASTOMOTIC ULCER .

Varieties : (1) Gastro jejunal ulcer

(2) Jejunal ulcer

Etio : Males between 30 and 60

Frequency : 2%

Pre-disp : Gastro-jejunostomy for duodenal ulcer :

With . (a) Short history

+ (b) Hyper-acidity

+ (c) Hyper-mobility

+ (d) Rapid emptying

Path : (1) Acid factor :

(A) Non-indicated gastro-jejunostomy :

(a) No duodenal ulcer

(b) Duodenal ulcer with high acidity

(B) Entero anastomosis between loops

(C) Inefficient post-operative medical treatment

(2) Infective factor :

: Failure to eradicate septic foci

(3) Technique factor :

(a) Non absorbable sutures on the mucosa

(b) Clamp trauma

(c) Faulty stoma

Clinical groups :

- (1) **Recurrence of original syndrome :**
3 to 6 months after operation
- (2) **Onset of one of the complications :**
 - (a) **Perforation :** Acute, subacute, chronic
 - (b) **Hæmorrhage :** Hæmatemesis, melæna
- (3) **X-Ray evidence**
- + (4) **Presence of gastro jejunostomy scar**

Diagnosis Any dyspepsia or acute abdomen with gastro jejunostomy scar

- Diff diag**
- (1) Recurrent ulcer
 - (2) Duodenal ulcer
 - (3) Perforative acute abdomen
 - (4) Hæmatemesis causes
 - (5) Dyspepsias

Compl (A) Perforation :

- (1) **Acute :** Acute spreading peritonitis
- (2) **Subacute :** Perigastric abscess
- (3) **Chronic :**

(a) **External :**

Palpable mass }
↓ External fistula } supra umbilical

(b) **Internal :**

Jejuno colic }
Gastro colic } fistula
Gastro jejuno colic }

- (B) **Hæmorrhage .** (a) Hæmatemesis
(b) Melæna

(C) **Adhesions :** Pyloro duodenal obstruction

Treat (1) Ulcer :

(a) **Medical and dietetic :**
(See under Peptic Ulcer)

↓ (b) **Surgical**

Ind (1) Pain

(2) Complications

Tech (1) Reconstruction of normal anatomy

Ind Un indicated primary operation

(2) Partial gastrectomy

Hofmeister Finsterer

(3) Pyloroplasty or gastro-duodenostomy

(2) **Complications**

(A) **Acute perforation**

(a) Closure

+ (b) Peritoneal toilet & drainage

+ (c) Jejunostomy

- (B) Gastro jejuno colic fistula
- (a) Restoration of normal anatomy
 - (b) Wilkie's two stage operation
 - (c) Radical excision
 - (a) Resection of Jejunum
Colon
Stomach
 - (β) Anastomosis of Jejunum
Colon
Gastro jejunostomy
- (C) Hæmorrhage medical treatment
- (D) Duodenal obstruction duodeno-jejunostomy

6) INTESTINAL OBSTRUCTION

- Causes (1) Peristoma adhesions
(2) Mesocolic hernia
(3) Retrograde jejuno-gastric intussusception
- Etiology More in females
Time Any time after gastro jejunostomy
- Clinic (A) Acute Acute on chronic high intestinal obstruction
(B) Chronic Intermittent high intestinal obstruction
(C) X Rays
- Treatment (1) Reduction and fixation
(2) Resection of anastomosis
(3) Entero anastomosis of loops

6) DIARRHŒA

- Etiology (a) Idiopathic
(b) Achylia
(c) Too rapid emptying
(d) Gastro } colic fistula
Jejuno }
- Treatment (A) Conservative
(a) Acid hydrochloric dil
 $\frac{1}{2}$ to 1 drachm in a cup of water B D
(b) Pancreatic extract
(B) Operative
- Indication Gastro } colic fistula (See above)
Jejuno }

7) FAILURE OF GASTRO JEJUNOSTOMY

- Causes (1) Faulty selection of cases
(2) Un-indicated operation
(3) Faulty pre operative treatment
(4) Technical errors :
(a) Failure to treat the ulcer directly
(b) Failure to remove primary septic focus
(c) Abnormal stoma
(a) Ill placed
(β) Ill sized

- (d) Abnormal loop
- (e) Abnormal mesocolic opening
- (f) Faulty handling
- (g) Faulty clamping
- (h) Faulty sutures

(5) **Faulty post operative management**

- (a) Neglect of dietetic treatment
- (b) Neglect of medical treatment

Moynihan's post gastro enterostomy instructions

- (1) Must cure thoroughly
- (2) Avoid condiments raw vegetables
hot and irritating foods
- (3) Avoid nicotine and alcohol
- (4) Take butter cream, milk
- (5) Care of the teeth and gums
- (6) Antacids
- (7) Test meal every three months

(6) **Post operative complications**

(8) **GASTRIC CRIPPLING**

- Etio** (a) Chronic gastritis
(b) Recurrent or anastomotic ulcer
(c) Adhesions

Clinic Belching fullness water brash nausea vomiting

- Treat** (a) Diet with stomachics
(b) Change of environments
(c) Gastric lavage
(d) Diathermy
(e) Abdominal belts

(9) **ANÆMIA**

Etio Gastrectomy

- Path** Loss of (a) Hydrochloric acid
(b) Stomach principle

Varieties (A) **Hyperchromic microcytic**

Treat Liver and stomach extracts
Iron and other metals

(B) **Pernicious**

Treat Repeated blood transfusions

(10) **GASTRIC FISTULA**

- Etio** (1) **Gastrostomy**
(2) **Perigastric abscess**

Clinic Leakage of acid gastric juice

Compl (a) **Contraction of the gastrostomy opening**

Treat Keep in the tube or plug

(b) **Relaxation of the gastrostomy opening**
 Treat Leave out the tube or plug

(c) **Hæmorrhage :**
 Treat Gentle insertion of lubricated tube

(d) **Dermatitis :**
 Treat Emollient and alkaline dressings

(e) **Accidental premature removal of tube :**
 Compl Peritoneal feeding due to misplaced tube
 Prophylaxis Gastrostomy feeding by a responsible person

(11) PERITONITIS

Causes (1) **Leakage :**
 (a) Gastric contents from stoma
 (b) Sepsis from abscess
 (c) Peritoneal feeds in gastrostomy
 (2) Idiopathic

(12) PAROTITIS (See under Parotid)

Etiology Gastro-duodenal operations
 Especially gastrostomy

(13) CHEST COMPLICATIONS

(D) IMPORTANT POINTS

Congenital affections :

- (1) Hepatico duodenal fold is very important in biliary surgery and has to receive first attention in cholecystectomy
- (2) Differential diagnosis between
 - (a) Hypertrophic pyloric stenosis
 - (a) Latency of three weeks
 - (β) No bile in vomit
 - & (b) Congenital duodenal septum
 - (a) From birth
 - (β) Bile in vomit
- (3) Differential diagnosis between
 - (a) Pyloric atresia vomiting from birth
 - (b) Hypertrophic stenosis vomiting after three week
- (4) Suspect congenital pyloric stenosis in
 - (a) Marasmic child
 - + (b) Distended upper abdomen
 - + (c) Vomiting a few weeks after birth
- (5) The prognosis of hypertrophic stenosis depends on
 - (a) Time of operation
 - (b) Pre and post operative care
- (6) Meticulous care should be taken in the post operative dieting after Ramstedt operation These children have low food tolerance, obtain breast milk for all patients for first five days.

Gastro-duodenal trauma .

- (7) Trauma to gastro-duodenal area has following syndrome
 - (a) Acute collapse with no external signs
Splanchnic shock
 - (b) Post traumatic acute abdomen
 - (α) External wound absent rupture
 - (β) External wound present penetration
- (8) *In a stab wound of the abdomen internal mischief may be out of all proportion to the size of external wound, especially if a long and narrow instrument is used.*
- (9) The clinical picture and prognosis of stomach injury depend on the following factors
 - (a) Size of the solution of continuity
 - (b) Amount of gastric contents at the time
 - (c) Extent of peritoneal soiling
 - (d) Time between accident and treatment
 - (e) Resistance of the patient to shock & sepsis
- (10) *Explore every stab wound of the abdomen by open exploration*
- (11) Foreign bodies in the stomach can be classified as
 - (a) Dangerous operative treatment
 - (α) Perforative
 - (β) Obstructive
 - (b) Non-dangerous conservative treatment
 - (c) Potentially dangerous observative treatment
- (12) *Never give a purge for a foreign body in the digestive tract*
- (13) *Never fail to follow the course of a passing foreign body by repeated X Ray examinations*
- (14) *Never forget to examine every stool passed within the observative period in cases of foreign bodies*
- (15) Chemical opponents and emollients are the right kind of treatment in immediate cases of caustic burns of the stomach

Peptic ulcer

- (16) *Greatest enemies of duodenal ulcer patients*
 - (a) Tobacco
 - (b) Spicy food
 - (c) Alcohol
- (17) Gastric and duodenal ulcers never arise in a normal mucosa, but are always preceded by inflammatory changes and erosions *the periodicity of symptoms is due to waxing and waning of the associated gastritis*
- (18) Causation of chronic peptic ulcer
 - (a) Local trauma
 - (α) Mechanical
 - (β) Circulatory
 - + (b) Eroding acid gastric juice.

- (19) All peptic ulcers are at first acute and become chronic secondarily due to
- Acid factor*
 - Motility factor*
 - Infection factor*
 - Neurogenic factor*
- (20) *Abdominal triad of Wilkie*
- Chronic appendicitis*
 - Chronic duodenal ulcer*
 - Chronic cholecystitis*
- (21) *Morbid anatomy.*
- Chronic ulcer no muscular coat in the base*
 - Primary carcinoma muscularis present in the base*
- (22) In duodenal ulcer, bigger the meal, greater the interval of freedom from pain, but worse the pain after it
- (23) *Periodicity of symptoms*
- Is present in
 - Gastric ulcer
 - Duodenal ulcer
 - Anastomotic ulcer.
 - Is caused by waxing and waning of associated gastritis.*
- (24) Differential diagnosis between angina pectoris and high gastric ulcers which give pain behind the ensiform cartilage, is sometimes difficult
- (25) *Main principles of treatment in peptic ulcer*
- Elimination of sepsis*
 - Neutralisation of acidity*
 - Correction of spasm*
 - Avoidance of irritation*
 - Removal or local treatment of ulcer*
- (26) *The treatment of peptic ulcer is*
Medico → surgico → medical
- (27) *Consider chronic peptic ulcer as essentially a disease for the physician to treat, surgery is for complications only*
- (28) Every ulcer patient who has failed to respond satisfactorily to Sippy diet, should be treated with *aluminum hydroxide* before surgical intervention is carried out
- (29) Every patient with a peptic ulcer should be under a physician from the time the diagnosis is made to the end of his life whether he was operated on or not.
- (30) *The great thing is to feed an ulcer patient, feed him especially after he has bled or before operation, feed him on a diet of milk, feed him frequently so that stomach is never empty during the waking hours, and if the patient has pain, ask yourself if you could not feed him oftener*

- (31) Younger men with non stenosing ulcers should be told that if they will abandon alcohol and tobacco, and take frequent meals, they will keep well.
- (32) *Sippy's diet* is the best method of treatment for peptic ulcer and hæmatemesis.
- (33) *Vitamine C* medication must become the first line of therapy in peptic ulceration
- (34) Dangers of antacids
 - (a) Rebound acidity
 - (b) Alkalosis
- (35) *Sodium bicarbonate is the most powerful stimulant of gastric secretions and produces rise in acidity after initial neutralisation*
- (36) Bismuth oxycarbonate does not act as an alkali in stomach
- (37) Indications for surgery in peptic ulcers
 - (1) Failure of prolonged medical treatment
 - (2) Perforation
 - (3) Hæmorrhage
 - (4) Obstruction
 - (5) Malignant degeneration.
- (38) For duodenal ulcer, operation is only necessary in the presence of complicating factors such as
 - (a) Stenosis
 - (b) Recurrent hæmorrhage
 - (c) Perforation
 - (d) Penetration
- (39) In gastric ulcers if the medical treatment has failed and especially if the ulcer is deep and adherent, time has come for surgery
- (40) Unless a gastric ulcer responds quickly to medical treatment not only by improvement in symptoms but also by reduction in size of the ulcer crater as shown by X-Rays, it ought to be explored
- (41) *Chronic gastric and duodenal ulcers are always palpable at operation and should always be demonstrated to the assistant before any treatment is decided upon*
- (42) *Operations for peptic ulcer*
 - (a) *Simple excision of ulcer*
 - (a) Caustery
 - (b) Wedge
 - (b) *Short circuit*
 - (a) Without treatment of ulcer
 - (b) With treatment of ulcer
 - (c) *Gastrectomy.*
 - (a) Wedge resection
 - (a) Sleeve resection
 - (r) *Partial gastrectomy*

- (43) *Gastrectomy remains the operation of choice for every gastric ulcer and for duodenal ulcer with (a) high acidity or (b) recurrent severe bleeding* In men past 50, with falling acidity, a gastro enterostomy is seldom followed by recurrent ulceration and is nearly always satisfactory
- (44) Partial gastrectomy for peptic ulcer is indicated in
 (a) Suspected malignancy
 (b) Abnormally high acid curve.
- (45) Partial gastrectomy is better than gastro jejunostomy for gastric ulcers and duodenal ulcers of recent origin with high acid curve *Gastro jejunostomy is the best operation for duodenal ulcer, provided there is no abnormally high acid curve and rapid emptying and especially if there is pyloric obstruction*
- (46) Operations for duodenal ulcer
- (1) *Gastro jejunostomy*. With or without excision of ulcer
 Ind (a) Elderly patients
 (b) Not very high acidity
 (r) Pyloric stenosis
 (s) Immobile duodenum
 - (2) *Gastro duodenostomy*
 Ind (a) Lean, anxious patients
 (b) Hyperchlorhydria
 (c) No pyloric stenosis
 (d) Mobile duodenum
 - (3) *Partial gastrectomy*
 Ind (a) Young patients
 (b) Hyperchlorhydria
 (c) Stenosis or no stenosis
 (d) Immobile duodenum
- Tech (A) Fundusectomy
 Removal of a large wedge from the mid stomach
- (B) Resection of ulcer and pyloric ring
 Judd's partial duodeno gastrectomy
- (C) Resection for exclusion Finsterer RZA
 (a) Removal of 2/3rds of stomach
 + (b) Spur formation
- (47) In duodenal ulcers, gastro jejunostomy alone gives 80% of satisfactory results, in gastric ulcers pyloric exclusion and direct treatment of the ulcer must be added on to the gastro jejunostomy, gastrectomy being the best operation for them

Perforations •

- (48) *Slow pulse found during the period of first eight hours after perforation is a sign of great diagnostic value*

- (49) Differential diagnosis
 - (a) Perforated ulcer
 - (b) 'Dry' perforated ulcer
 - (c) 'Pseudo' perforated ulcer
- (50) Perigastric abscess is nearly always due to gastric or duodenal perforation
- (51) Prognosis in gastro duodenal perforations
 - (a) Condition of the stomach at the time of perforation
 - (b) Size of the perforation
 - (c) Amount of extravasation
 - (d) Time between perforation and treatment
- (52) *Operation under 6 hours saves nearly all delayed operation saves few. There is no condition except hæmorrhage, in which it is more important for every one concerned to move quickly*
- (53) Important guides to the site of a perforation after the laparotomy
 - (a) Particular spot from which fluid wells up
 - (b) Follow the direction of increasing inflammation
- (54) As far as possible avoid narrowing of the lumen at the site of sutured perforation if unavoidable, do gastro jejunostomy in addition to suture
- (55) Remember that in gastro-duodenal perforations
 - (a) Peritoneal toilet is not very necessary
 - (b) *Keep suprapubic drain in all life cases*
 - (c) Additional right flank tube in all duod perforations (may be omitted in early cases)
- (56) Causes of post operative death in perforation
 - (a) Within 48 hours Shock
 - (b) Within one week Peritonitis
Pneumonia
 - (c) Third week Pylephlebitis
Subphrenic abscess.
- (57) *Amount of extravasation is a more important factor than time in the prognosis of gastro-duodenal perforations, and higher the pulse rate, worse the prognosis*

Hæmatemesis.

- (58) *The most common causes of hæmatemesis*
 - (a) *Œsophageal varices in cirrhosis liver*
 - (b) *Gastrostraxis young women*
 - (c) *Chronic gastric ulcer or carcinoma elderly men*
- (59) Gastric ulcer is three times as common as duodenal ulcer as a cause of severe hæmatemesis
- (60) *Days of starvation treatment of hæmatemesis are over Patient is put on full diet with plenty of animal protein and iron*

- (61) First step in dealing with severe hæmorrhage from peptic ulcers is to start medical treatment, followed by drip blood transfusion
- (62) *In every case in which bleeding is sufficient to raise the pulse to 100 and reduce the hæmoglobin to 50%, a blood drip transfusion should be started and the patient removed to an hospital, operate when hæmoglobin percentage has mounted to 60% with blood drip transfusion still running*
- (63) For first hæmorrhage in the presence of known and proved gastro duodenal ulcer
- (a) Match the blood
 - (b) Drip transfusion
 - if (α) Pulse more than 100
 - (β) Hæmoglobin less than 50%
 - (c) Operation
 - when (α) Hæmoglobin 90%
 - + (β) Drip transfusion going in
 - + (γ) Ulcer with a long history
- (64) Operation for hæmatemesis from peptic ulcer, gives good results if done on the first or second day
- (65) Treatment of grades of hæmatemesis
- (1) Grave Medical + blood drip
 - (2) Severe (a) Medical + blood drip
 - ↓ (b) Operative life saving
 - If condition allows
 - (3) Moderate (a) Medical
 - ↓ (b) Operative for ulcer
 - In quiescent period
 - (4) Trivial Operative for ulcer
 - As soon as possible
- (66) In operation for hæmorrhage from peptic ulcers, we should remember that we are not operating on a chronic peptic ulcer but to save the life from bleeding to death
- (67) Under no circumstances, advise operation in gastrostaxis
- (68) *Do blood transfusion in every case of severe hæmatemesis*
- (69) Massive hæmatemesis
- (a) Blood transfusion
 - ↓ (b) Medical and dietetic treatment
 - ↓ (c) Blood drip transfusion.
- (70) When, operating for bleeding peptic ulcer no obvious lesion in the stomach or duodenum is found examine
- (a) Posterior wall of the duodenum
 - (b) Liver
 - (c) Appendix through a separate incision
 - (d) Meckel's diverticulum through appendix incision

Gastro-duodenal obstruction :

- (71) Superior mesenteric arterial pressure is a sequelæ of prolapsed cæcum and an etiology of
- Acute gastro duodenal ileus
 - Chronic duodenal ileus
 - Post operative vicious circle vomiting
 - Peptic ulcer
- (72) *Splashing three hours after a meal*
Gastric dilatation
- (73) *Delay in the emptying of the stomach is only to be diagnosed after 6 hours stasis*
- (74) *A glass of milk with about a dozen raisins at night, stomach wash next morning any residue denotes pyloric obstruction*
- (75) Slowly progressing or stationary obstruction is due to fibrosis, rapidly progressing obstruction is due to malignancy
- (76) *Avoid soda bi-carb in all cases with pronounced vomiting, either as medication or lavage lotion, to ward off alkalosis*
- (77) *Do not fail to do blood urea tests in every case of pyloric stenosis*
- (78) *Do not forget to give gastric lavage before any operation on the stomach, where chronic gastric dilatation is present, it is an advantage to keep the tube in for gastric aspiration during the operation if necessary, otherwise following may result*
- Respiratory obstruction
 - Aspiration pneumonia
 - Peritoneal extravasation
- (79) *Do not give isotonic glucose infusion in high grade pyloric stenosis, due to danger of hypochloræmia with coma and tetany*

Ulcer-cancer :

- (80) *Ulcers on the greater curvature should always be considered malignant, also all ulcers more than an inch in diameter*
- (81) Risk of carcinoma in gastric ulcer is not great but is greater than the risk of operation.
- (82) Gastric ulcer starting after 45, is probably malignant even if it runs a slow course over years
- (83) In gastric ulcer, there is always the lurking shadow that it may be malignant in duodenal ulcer the fear is absent

Gastric Carcinoma :

- (84) Carcinoma stomach is an invariable sequelæ of chronic gastritis.

- (85) Ulcerative carcinoma is the most malignant and deposits early in glands and liver, gland involvement is least in
- (a) Fungoid type
 - (b) Leather bottle stomach
 - (c) Carcinoma at
 - (a) Anterior wall
 - (β) Greater curvature
 - (γ) Fundus
- (86) Enlarged glands in carcinoma stomach are not always carcinomatous, they may be inflammatory, especially in ulcerative primary and so do not necessarily contra indicate operation
- (87) *Chief symptoms in carcinoma stomach*
- (1) Short, continuous, dyspeptic anorexia
 - (2) Dull continuous pain or discomfort
 - (3) Anæmia with loss of weight
 - (4) History
 - (a) Long history of peptic ulcer with a recent change in the classical syndrome
 - (b) Short history in a middle aged patient
- (88) Sudden onset of dyspepsia not reacting to three weeks medical treatment after the age of 40 suspect carcinoma do test meal, if hypo or achlorhydria explore
- (89) Rapidly developing signs of pyloric obstruction in a patient past middle age ? Carcinoma pylorus
- (90) *Dyspepsia starting after the age of 45 must always be regarded with grave suspicion*
- (91) Though there is no characteristic early symptomatology of gastric carcinoma there is nearly always
- (a) Dyspepsia
 - (b) Anorexia
 - (c) Pain or discomfort
- (92) Symptomatology of gastric carcinoma
Pain → fullness → weakness → indigestion → anorexia → vomiting → loss of weight
Special symptoms
- (a) Dysphagia
 - (b) Hæmatemesis.
- (93) *It is far more important to ascertain the cause of a chronic dyspepsia in a middle aged person than to treat it*
Alkalies—for chronic dyspepsias of middle aged people—are the best friends of the undertaker
- (94) *In every case of suspected carcinoma of the stomach*
Examine
- (a) Liver
 - (b) Peritoneum
 - (a) Fluid
 - (β) Multiple nodules
 - (c) Supraclavicular glands
 - (t) P R or P V

- (95) *Rectal and supraclavicular examinations are very important in gastric carcinoma*
- (96) *Negative X-Ray does not exclude malignancy, if other clinical signs are present.*
- (97) *Gastric test meal is more important in primary gastric carcinoma, than in carcinoma secondary to gastric ulcer.*
- (98) *Common laboratory signs of gastric carcinoma :*
 (a) *Achlorhydria*
 (b) *Occult blood in stools*
- (99) *In every case of gastric carcinoma, exploration should be undertaken, except where irremovable metastatic growths can be demonstrated pre operatively or where the general condition of the patient disallows such a step.*
- (100) *To wait till cancer of the stomach is proved by clinical course is to lose most of the cases. If the symptoms are not better in two months, explore.*
- (101) *Recent dyspepsia (not amenable to one month's medical treatment) + Achlorhydria + Middle age + Exploratory laparotomy.*
- (102) *If resection cannot be performed in pyloric cancer, exclusion (by cutting stomach across, joining the proximal portion to jejunum, and closing the distal portion) is better than simple gastro jejunostomy*
- (103) *Fungating growths give better end results than ulcerating or infiltrating. Enlarged lymph glands should not necessarily contra indicate operation*

Gastro duodenal fistulae :

- (104) *Most common cause of internal duodenal fistula is . Gall stone.*
- (105) *Most common causes of external duodenal fistula are*
 (a) *Perforated duodenal ulcer*
 (b) *Cholecystectomy with duodenal trauma.*

(106)	<i>Variety</i>	<i>Reaction</i>	<i>Position</i>	<i>Treatment</i>
	Gastric	Acid	Left	Alkaline dressings
	Duodenal ..	Alkaline	Right	Acid dressings

- (107) *Complications of gastro duodenal fistulae .*
Irritation and digestive ulceration of skin

X-Rays :

- (108) *Delay in emptying of the stomach is to be diagnosed only after 6 hours' stasis.*

- (109) Duodenal ulcer ·
 (a) Large stomach of normal contour
 + (b) Hyper motility
 + (c) Six hours' stasis
- (110) X Ray evidence of peptic ulcer or carcinoma
 (a) Direct persistent deformity *in more than one plate*
 (b) Indirect. abnormal motility, size, retention
- (111) *Never diagnose a barium deformity on a single X Ray plate*

Gastro duodenal operations :

- (112) *Operative treatment is indicated if even after one month's strict medical and dietetic treatment, occult blood persists in gastric contents and faeces*
- (113) *No stomach operation should be done within 4-6 weeks of extraction of teeth*
- (114) Give dilute hydrochloric acid a week before the operation in all achlorhydric cases Continue it in post operative period in
 (a) Total gastrectomy
 (b) Gastrectomy anaemia
 (c) Achlorhydria.
- (115) *Never forget pre operative stomach wash and aspiration in every case of alimentary obstruction, acute or chronic*
- (116) *In every case of peptic ulcer explore in addition*
 (a) Biliary apparatus
 (b) Pancreas
 (c) Appendix may be removed as routine
- (117) In exploratory laparotomy for gastro duodenal ulcers, do not forget the association of gastric and duodenal ulcers
- (118) Most important point in gastro duodenal or intestinal anastomosis is to avoid angulations, torsions, long loops, tensions and adhesions

Gastro jejunostomy :

- (119) *Gastro jejunostomy is a most satisfactory operation only for pyloric obstruction* If used for non obstructed duodenal ulcer in a case of high acidity and rapid emptying, it is likely to heal the duodenal ulcer with temporary relief of pain at the cost of a subsequent gastro jejunal ulcer
- (120) A mechanically efficient gastro enterostomy causes the disappearance of a duodenal ulcer but may lead to the formation of an anastomotic ulcer An inefficient operation fails to cure the duodenal ulcer and in addition, causes an anastomotic ulcer
- (121) Contra indications for gastro jejunostomy

- (a) Clinical (a) Short history
 + (β) Hyper acidity
 + (γ) Hyper motility
 + (δ) Hyper evacuation
 (b) Operative Failure to demonstrate the ulcer

(122) *Never do a gastro enterostomy in the absence of a demonstrable organic lesion*

(123) Gastro jejunostomy 'resume'

- Ind (a) Failure of medical treatment
 (b) Appearance of complications
 Pyloric obstruction

Tech Posterior
 No loop
 Iso peristaltic

Site Stomach
 (a) Most dependant part as the patient stands
 or (b) *On a line with the right margin of cardia*
 Jejunum 4-6 inches from the flexure

Direction (a) Vertical curvature to curvature
 (b) Oblique
 (c) Transverse if the stomach is small

Approximation Through the mesocolon avascular region

Application Proximal jejunum to lesser curvature

Sutures (a) Anchor sutures
 (b) Sero muscular posterior
 (c) All coats posterior
 (d) All coats anterior
 (e) Sero muscular anterior
 (f) Gastro mesocolic

Material 0-00 chromicised catgut on eyeless round bodied needle

Method Sero muscular and all coats sutures begin and end at opposite corners

Points Do not forget to
 (a) Pack off
 (b) Not to excise any muc mem
 (c) Loosen the clamps and look for haemorrhage after the completion of all coats suture and before putting in the anterior sero muscular suture
 (d) Remove the packs and count before closure

(124) *Common causes of failure after gastro jejunostomy*

- (a) *Non indicate l operation*
 (a) No organic lesion very bad
 (β) Organic lesions without obstruction

- (b) *Neglect of post operative medical and dietetic treatment*
- (c) *Failure to eradicate chronic septic focus*

(125) Common complications of gastro jejunostomy

- (a) Hæmatemesis
- (b) Vicious circle vomit
- (c) Gastro jejunal or jejunal ulcer
- (d) Failure of operation

(126) *Never fail to give medical and dietetic instructions to patients after gastro jejunostomies and to do their test meals every three months for about two years*

(127) *Do not forget that gastro jejunostomy is a step in the medico surgico medical treatment of the peptic ulcer and is not the sole cure for it. It is bound to be a failure or perhaps a source of danger if careful post operative regime is not instituted*

Gastro duodenostomy :

(128) Indications

- (a) Gastro jejunostomy contra indicated
 - (a) Probability of anastomotic ulcer
 - (β) Gastro ptosis
- (b) Duodenum and pylorus mobilisable
- (c) No peri duodenal adhesions
- (d) No active ulcer

Gastrectomy

(129) Partial gastrectomy in peptic ulcer is indicated in

- (a) Suspected malignancy
- (b) Abnormally high acid curve

(130) Extent of the operation

- (1) Gastro duodenal ulceration
Leave the pyloric antrum behind
- (2) Carcinoma
Remove at least $\frac{3}{4}$ " of the duodenum

(131) Different techniques

(A) *Billroth I End to end gastro duodenostomy*

- (1) Classical
- (2) Schoemaker
 - (a) Excision and reconstruction of lesser curvature
 - (β) End to end anastomosis
- (3) Kocher
 - (a) Closure of gastric stoma
 - (β) Anastomosis of duodenal stoma to posterior gastric wall
- (4) Haberer Finney end to side gastro duodenostomy
- (5) Horsley Flaring open the duodenal stoma to enlarge the gastro duodenal junction

(B) *Billroth II*

- (a) Closure of duodenal stump
- (b) Closure of gastric stoma
- (c) *Side to side gastro-jejunostomy*
 - (α) Anterior
 - (β) Posterior Mikulicz

(C) *Polya*

- (a) Closure of duodenal stump
- (b) *End to side gastro-jejunostomy*
 - (1) Classical
 - (2) Mikulicz
 - (α) Closure of duodenal stump
 - (β) Closure of gastric stoma
 - (γ) Posterior side to side anastomosis

(1) *Anterior Polya*

- (a) *Balfour*
 - (α) Long loop
 - (β) Iso peristaltic
 - (γ) Entero anastomosis between loops
- (b) *Moynilian*
 - (α) No loop
 - (β) Retro-peristaltic
- (c) *Kronlein*
 - (α) Horizontal
 - (β) Iso peristaltic

(2) *Posterior Polya*

- (a) *Classical*
 - (α) Long loop
 - (β) Iso-peristaltic
- (b) *Finsterer*
 - (α) Long loop
 - (β) Iso peristaltic
 - (γ) Spur formation
- (c) *Reversed loop*
 - (α) No loop
 - (β) Retro peristaltic
- (d) *Lahay*
 - Transposition of proximal loop above the mesocolon

(D) *Roux Y*

- (α) Division of jejunum across
- (β) End to side gastro jejunostomy
- (γ) End to side jejuno-jejunostomy

(132) *Difference in two techniques*

- (a) *Iso peristaltic*
 - (α) Long loop
 - (β) Proximal jejunum at lesser curvature

- (b) Retro peristaltic
 - (a) No loop
 - (β) Proximal jejunum at greater curvature
- (133) Finsterer R zur A resection for exclusion
 - (a) Removal of $\frac{1}{3}$ of distal stomach
 - (b) Posterior iso peristaltic end to side gastro jejunostomy
 - (c) Spur formation
- (134) Greater omentum in gastrectomy
 - (a) Ulcer operations
 - (a) Preserve
 - (β) Do not deprive of the blood supply
 - (b) Cancer operation
 - Remove.
- (135) Amount of stomach removed is an important etiological factor in post gastrectomy anaemia

Gastrostomy -

- (136) Special complications
 - (1) Leakage peritonitis
 - (a) Never leave the care of the feeding tube to an inexperienced nurse within the first five days
 - (b) Always inquire whether the tube was inadvertently drawn out during the first five days
 - (2) External leakage with skin irritation
 - Emollient and alkaline skin dressings
 - (3) Abnormal stoma
 - (a) Constriction keep in the tube
 - (b) Relaxation leave out the tube
 - (4) Tube blockage
 - (i) Clean after every feed by pouring saline or water
 - (b) Syringe in
 - (c) Withdraw if too much insertion
- (137) Never defer the gastrostomy till the patient is moribund

Post operative treatment

- (138) Take special care of the following after gastro duodenal operations
 - (a) Oral cavity
 - (b) Lungs.
- (139) *It is a good practice to leave in a stomach tube for 24 hours after a gastric operation*
 - For (a) Aspiration
 - (b) Lavage
 - (c) Feeding

Post-operative complications

- (140) *Keep a vomit chart after gastric operations* It is after 48 hours if vomiting commences or large quantities of bile

are recovered by gastric aspirations, that a serious view of the case must be taken.

If vomiting persists and all the fluids given by the mouth can be recovered by a tube it is necessary to operate again usually between the tenth and twentieth days.

- (142) *Post operative acute dilatation of the stomach usually comes on within first 48 hours of operation*
- (143) Post operative hæmatemesis
 - (A) Post gastro jejunostomy
 - (a) Whilst a most conservative attitude should always be adopted towards re opening the abdomen, there should be no such attitude towards blood transfusion
 - (b) Curious post operative peritonitis supervenes on about the fifth day after the second operation
 - (c) If bleeding continues inspite of blood transfusion, operation must be resorted to
 - (B) Post gastrectomy
 - (a) Re operation is absolutely contra indicated
 - (b) Blood transfusion is the only hope.
- (144) Peritonitis is the cause of death in 70% of fatal cases after gastrectomy and in 30% after gastro jejunostomy
- (145) *The one tragedy in peptic ulcer surgery is the appearance of anastomotic or jejunal ulcer after gastro jejunostomy, which has an incidence of 2%, it occurs in hyper acid and hyper motile stomachs with recent symptoms and in those cases where post operative medical and dietetic treatment is neglected*
- (146) Gastro duodenostomy is to be preferred to gastro jejunostomy in patients with high acidity
- (147) Anastomotic ulcer etiology
 - (a) Acid factor *hyperchlorhydria*
 - (b) Infective factor *persistent septic focus*
 - (c) Technical factor *operative trauma*
 - (d) Negligence factor *post operative inefficient regime*
- (148) Best permanent results for gastro-jejunal ulcers follow gastrectomy by Finsterer method
- (149) If hæmorrhage has followed gastro jejunostomy anastomosis should be undone even if nothing can be palpated after exploration laparotomy
- (150) Acute retrograde gastro jejunal intussusception
 - (A) Acute intestinal obstruction
 - (a) High obstruction
 - (b) Visible peristalsis left to right
 - (c) Epigastric scar
 - (d) Mobile mid abdominal tumour

- (B) Hæmatemesis after gastro jejunostomy
- (C) Recurrent vomiting after gastro-jejunostomy.

(151) *Failures of gastric surgery are due to too great a*
opening the abdomen :

- (a) Before a full trial is given to medicine
- (b) Before full investigations are made
- (c) Before full pre operative regime is over,

(152) *Usual causes of failures after gastric surgery :*

- (a) Too patent stoma
- (b) Vicious circle vomit
- (c) Peri anastomotic gastritis.
- (d) Persistence of original ulcer
- (e) Anastomotic ulcer
- (f) Gastrectomy anæmia.

General :

(153) *The common gastro duodenal emergencies are*

(1) *Perforation :*

- (a) *Stab wound*
- (b) *Foreign body*
- (c) *Peptic ulcer*
- (d) *Carcinoma*

(2) *Acute hæmatemesis :*

- (a) *Cirrhosis liver*
- (b) *Gastric :* (a) *Ulcer*
 (β) *Carcinoma*
 (γ) *Gastrostaxis*

(c) *Duodenal . ulcer*

(3) *Foreign bodies*

(4) *Acute dilatation of the stomach*

(5) *Acute phlegmonous gastritis*

(6) *Perigastric abscess.*

(154) *'Resume' of gastro duodenal treatment :*

(A) *Gastric ulcer :*

- (a) *Excision + gastro enterostomy*
- (b) *Gastrectomy*

(B) *Duodenal ulcer :*

- (a) *Gastro jejunostomy :*
 (a) *Simple*
 (β) *With excision of ulcer*
- (b) *Gastro duodenostomy*
- (c) *Gastrectomy .*
 (a) *Judd*
 (β) *Finsterer R & A*

(C) *Gastric carcinoma :*

: Radical gastrectomy

(D) *Gastro duodenal perforation :*

- (a) *Simple suture*

- (b) Suture + gastro jejunostomy
- (c) Partial gastrectomy
- (E) Hæmatemesis
 - (a) *Local treatment* only ligature, cautery, excision
 - (b) Gastro enterostomy
 - (a) Simple
 - (β) With local treatment
 - (c) *Partial gastrectomy*
 - (d) Finsterer R z A
- (F) Pyloric obstruction
 - (a) *Gastro jejunostomy*
 - (b) Gastro-duodenostomy
- (G) Hourglass stomach
 - (a) *Partial gastrectomy*
 - (b) Gastro gastrostomy
 - (c) Gastro plasty
- (H) Gastro-jejunal ulcer
 - (a) Undo gastro jejunostomy
 - + (b) Pyloroplasty
 - or (b) Gastro-duodenostomy
 - or (b) *Subtotal gastrectomy*

Miscellaneous

- (155) *Normal quantity of gastric juice is from 1.5 to 3 litres a day, 50 ounces of milk will neutralise 1.5 litres*
- (156) Simple hyperchlorhydria does not lead to duodenal ulcer necessarily and is compatible with perfect health.
- (157) *Pain which awakens a patient from sleep is always organic.*
- (158) Causes of hunger pain
 - (a) Duodenal ulcer
 - (b) Hyperchlorhydria
 - (c) Excessive nicotine
 - (d) Carcinoma stomach
 - (e) Chronic appendicitis
 - (f) Cholecystitis
 - (g) Transverse colitis
 - (h) Neurasthenia.
- (159) Epigastric pain and dyspepsia in the obese
Do not forget small epigastric ventral hernia.
- (160) Bouts of vomiting unassociated with abdominal pain are not due to gastric disease
- (161) Tumours of the stomach have transmitted pulsations from the aorta and also move with respirations.
- (162) *In every case requiring an operation, get the permission for it before the administration of pre-operative morphia*

CHAPTER V

THE INTESTINES

(1) CONGENITAL MALFORMATIONS:

(1) EXOMPHALOS

Def Persistence of extruded midgut in the umbilical cord, with non closure of abdominal parietes

Varieties . (1) Complete
(2) Partial

Path Congenital umbilical hernia :
Covered by amnion

Clinic Hernia at the umbilicus containing intestines

Treat (a) Return of the contents into abdomen
↓ (b) Repair of the umbilical defect

(2) DERANGEMENTS OF ROTATION

(A) Non rotation (a) Small intestines on right side
(b) Proximal colon on left side

(B) Reversed rotation

Etio Return of proximal colon before jejunum

Path Transverse colon is deep to mesentery

Clinic Acute low intestinal obstruction
(Personal case age about 40)

(C) Mal rotation Misplaced intestinal parts

(D) Volvulus neonatorum

Def Volvulus of mobile midgut

Path (a) Axial rotation of midgut and mesentery
↓ (b) Acute kinking of third part of duodenum

Clinic Acute high intestinal obstruction in infants

Treat Explore → untwist → cœcoplexy

(3) INCOMPLETE DESCENT OF CÆCUM AND APPENDIX

Site Under the liver

Clinic Appendicitis in children simulates cholecystitis

Treat No McBurney incision in a child

(4) CONGENITAL INTESTINAL DIVERTICULÆ

(A) Duodenal (See under Duodenum)

(B) Ileal

(a) Acquired Multiple mesenteric

(b) Congenital Meckel's diverticulum

Def Persisting intra abdominal part of vitelline duct

Site Umbilicus to anti mesenteric border of ileum,
: Within two feet from ilio cæcal valve

Etio 2% of cases

- Varieties: (1) Umbilical faecal fistula
 (2) Umbilical sinus
 (3) Enterocystoma: a cyst
 (4) Ileal diverticulum:
 (a) Vermiform
 (b) Tubular
 (c) Spherical
 (5) Fibrous band: terminal ligament
- Clinical syndrome. (a) Pseudo appendicitis
 (b) Intestinal obstruction
 (c) Intussusception
 (d) Melæna in children
- Complication (1) Diverticulitis → perforation → peritonitis
 (2) Intestinal obstruction:
 (a) Volvulus
 (b) Kink
 (c) Band
 (d) Knot
 (e) Intussusception
 (f) Associated stricture
 (3) Hernia: Littre's hernia
 (4) Ulceration: Peptic, T.B., Typhoid, etc.
- Treat: (1) Exploration
 ↓ (2) Amputation of the diverticulum:
 With (A) Purse string closure:
 Compl. (α) Stricture ileum
 (β) Persistent diverticulum
 or (B) Transverse closure
 or (2) Excision: of (a) Diverticulum
 + (b) Parent part of ileum
 With: End to end anastomosis
- (C) Colonic Diverticulosis
- (5) **INTESTINAL ATRESIA**
 Def (a) Atresia: Solid cord with no lumen
 (b) Stenosis: Narrowed lumen
 Due to failure of expansion of the wall
- Sites (1) Duodenum: ampullary part
 (2) Ileum: lower end
 (3) Transverse colon: left half
 (4) Flexures
 (5) Recto-sigmoid junction
- Degrees (a) Stenosis
 (b) Septum
 (c) Atresia
 (d) Absent segment
- Etiol. Congenital error in development

- Clinic** Acute intestinal obstruction
 Vomiting + constipation + distension
Sign (a) Visible peristalsis if the site is lower
 (b) Barium enema
Treat (1) Immediate exploration
 ↓ (2) Proximal *stomy* ileum caecum colon
 Ind (a) Bad condition
 (b) Atresia of the colon
 or (3) Anastomosis short circuit

(6) MEGACOLON HIRSCHSPRUNG

- Def** Hypertrophy and dilatation of the left colon
Due to (a) Local segmental neuro-muscular inco-ordination
 (b) Achalasia pelvi rectal Pelvic & sigmoid colon
 (c) Achalasia internal anal sphincter rectum
 (d) Kinking due to lengthening + mobility
Etio Boys infants or adolescents
Clinic (1) Obstinate constipation
 (2) Enormous dilatation of colon
 (3) General chronic toxæmia
Sign X Rays barium enema
Compl (1) Colitis
 (2) Ulceration → perforation → peritonitis
 (3) Auto intoxication
Treat (A) Conservative
 (a) Enemata + bowel training + liquid paraffin
 (b) Dilatation of pelvi rectal junction sphincter
 (B) Operative
 (1) Sympathectomy
 (If barium enema is evacuated under spinal)
 (a) Lumbar ganglionectomy
 (b) Presacral nerve + Inf mes plexus.
 (2) Colon plication Nicolas
 Union of anterior and lateral tæniæ over the whole length of large intest from the caecum to the rectum.

(7) MICRO-COLON

- Def** Atresia of the whole or parts of the intestinal tract
Path Solid cords about the thickness of goose-quill
Clinic Acute intestinal obstruction in the new born
 (a) Pronounced vomiting
 (b) No distension
 (Personal case Whole of small intestine from 2nd part of duodenum to ileocaecal junction resembling coils of a round worm).

(8) ENTERO-PTOSIS

- Def** Lower position and sagging of the intra abdominal viscera, associated with hypotonia, organic impediments and neurasthenia

Etiology: (1) **Virginal:** congenital

(2) Maternal: weakness of abdominal wall

Clinic: (a) Neurasthenia and hypochondria

(b) Nervous dyspepsia influenced by posture

(c) Diathesis: lean, kyphotic

(d) Prominent lower abdomen

(e) X Rays barium meal

(a) Abnormal position: ptosis

(β) Hypotonia

(γ) Stasis

Associated : (A) Bands : (σ) Cystico duodenal band :

. Gall bladder to pylorus

(b) Pringle's mesocolic band:

Mesocolon to duod jej flexure

(c) Lane's first link

. Ilio caecal valve to ovary

(B) Membranes :

(a) Jackson's membrane:

Over caecum and asc. colon

(b) Payr's membrane:

Over splenic flexure

(c) Toldt's membrane.

- Over pelvic colon

(C) Mesenteries: (a) Cæcum

(b) Ascending colon

(c) Descending colon

(D) Kinks

(E) Abnormal mobility:

(a) Torsions

(b) Volvulus

(Г) **Sliding hernia:** Hernie en glissade

(G) Intestinal stasis: Hypotonia

Treat. (1) Conservative massage, supports, tonics

(2) Operative pexies: oöcöpexy, nephropexy.

(9) CONSTIPATION OF CHILDHOOD

Path (a) Normal colon

(b) Anatomical anomaly undescended testis

(c) Distended colon

(2) Kinks

(e) Elongated loop of colon

(f) Megacolon, sympathectomy

Treat Conservative Surgery not indicated

(II) TRAUMA TO THE INTESTINES:

(I) SUBCUTANEOUS TRAUMA

(A) Contusion: Associated or unassociated with abdominal wall contusion

(B) **Crushing**(C) **Tearing**(D) **Bursting**: (a) Closed loop
(b) Muscle strain: inguinal hernia
(c) Compressed air: colonPath: (a) Intraperitoneal intestines with mesentery
(b) Extraperitoneal: intestines without mesenteryClinic: *Of subcutaneous intestinal trauma*

(1) History of injury

(2) Shock

↓ (3) Peritonitis: pain + tenderness + rigidity
(a) Local
(b) GeneralCompl: (a) Peritonitis
(b) Retro peritonitisTreat: **Exploration and repair**(2) **STAB WOUND**:Clinic. (a) Wound in the parietes: small or large
↓ (b) Signs of perforationTreat: (1) **Immediate exploration in every case**:
Ind **Every stab wound of the abdomen**↓ (2) **Search** for the lesion or lesions↓ (3) **Suture**: At right angles to long axis

↓ (4) Peritoneal toilet

↓ (5) Drainage. if required

(3) **GUNSHOT WOUND**:Clinic: (1) History
(2) Wounds of entry and exit
(3) Perforative peritonitis + hæmo peritoneumTreat: (1) Exploratory laparotomy
↓ (2) Exploration of all organs
↓ (3) Suture of all foci + removal of the shots
↓ (4) Peritoneal toilet
↓ (5) Drainage(4) **FOREIGN BODIES**:

Sites: (a) Duodeno jejunal flexure; (b) Lower ileum

Clinic: (1) History or no history
(2) Intestinal colic with vomiting
(3) EnteritisCompl: (a) Acute intestinal obstruction
(b) Ulceration → perforation → (a) Abscess
(b) Peritonitis
↓ (c) Stricture: chronic intestinal obstruction

Treat (1) Observative

- (a) Do not give purgative
- (b) Give bulky food + lubricants
- (c) Examine every stool
- (d) X Ray daily

↓ (2) Operative Exploration

- Ind (a) Dangerous objects
- (b) Onset of acute complication
- (c) Stasis for more than a week

(III) SEPTIC INFLAMMATIONS OF THE INTESTINES**(A) SMALL INTESTINES****(1) REGIONAL ILEITIS**

Syn *Ileitis terminalis* (*Regional entero-colitis*)
Crohn's disease

Def Granulomatous cicatrising inflammation with
ulceration of terminal 8"-12" of ileum

Path Theory **Lymph block**

Low grade infection

- Morb anat (a) Inflamed bowel wall
(b) Oedema of the mesentery
(c) Enlarged lymph nodes

Clinic (1) Stage one

Pseudo subacute appendicitis

(2) Stage two

Colitis Diarrhoea with blood & mucus

(3) Stage three

Subacute or chronic intest obstruction

(4) Stage four

Abscesses and fistulae

Signs Palpable mass on abdominal or rectal exam

Special (1) X Rays **string sign of Kantor**

(2) Occult blood in stools

Diff diag (a) **Chronic appendicitis**

(b) **Meckel's diverticulitis**

(c) **Tuberculous intestines**

(d) **Malignancy**

Treat (1) **Resection**

(2) **Artificial anus**

(3) **Short circuit ileo transverso stomy**

(2) POST OBSTRUCTIVE ENTERITIS

(A) Constipation alternating with diarrhoea

In chronic or subacute intest. obstruction

(B) Post-operative diarrhoea with temperature

In acute intest. obstruction

(B) LARGE INTESTINES:**(1) ULCERATIVE COLITIS:**

Def: Chronic inveterate ulcerative inflammation of the colon

- Clinic:** (1) Recurrent colicky attacks
 (2) Diarrhœa with mucus and pus
 (3) Tender, firm colon
 (4) General chronic toxæmia

Sign: (a) **X-Rays:** (a) Lead pipe appearance
 (β) Loss of haustration

(b) Stools: microscopic and cultural

(c) **Sigmoidoscopy:**

- (α) Mucosal hyperæmia
 (β) Œdematous thickening
 (γ) Miliary abscesses
 (δ) Tiny multiple ulcers

Diff. diag: Any other cause of colitis: **dysentery**

Compl: (1) Perforation:

Treat: Suture + cæco or ileostomy

- (2) Pseudo polyposis
 (3) Strictures
 (4) Peri colitis

Treat: (A) **Conservative:** Medical and dietetic

- (a) High vitamin, high calorie, low residue diet
 (b) Bowel washes and bland instillations
 (c) Specific sera
 (d) Eradication of septic foci

(B) **Operative:** If failure of conservatism

- (1) Fulminating: ileostomy
 (2) Moderate:
 (a) Appendicostomy
 (b) Cæcostomy
 (c) **Ileostomy**
 (d) Colostomy: well above
 (3) Inveterate:

: Multi-staged colectomy:

- Tech:** (A) Paul-Mikulicz partial
 (B) Abdomino perineal resection
 (C) Subtotal colectomy:

- (a) Ileostomy
 ↓ (b) Colectomy upto sigmoid:
 : After six weeks
 ↓ (c) Abdomino perineal:
 : Few months later

(C) **Post operative:**

: Keep the stomy for at least six months after subsidence of all symptoms

(2) REGIONAL COLITIS:

Def: Localised inflammatory swelling of the colon

Path: (a) Hypertrophy of the wall

(b) Ulceration of the mucosa

Clinic: (a) Diarrhoea

(b) Palpable mass

Diff. diag (1) T B

(2) Malignancy

Compl: Intestinal obstruction or fistula

Treat: Resection

(3) DIVERTICULOSIS AND DIVERTICULITIS:

Def: Mucosal herniae through the muscular coats, between the mesocolic and antimesenteric longitudinal bands, along the entries of blood vessels or in appendices epiploicae

Etio: Elderly obese males with chronic constipation

Cause: Pulsion + stasis. caused by constipation

Site: Sigmoid colon

Clinic: (A) **Inflammatory syndrome: Perforation**

(a) Left sided appendicitis

(b) Left iliac abscess

(c) Pelvic or general peritonitis

(B) **Obstructive syndrome: Fibrosis**

: Chronic or acute on chronic

: Due to adhesions, kinking, volvulus

(C) **Carcinomatous syndrome: Hyperplasia**

: Hyperplastic diverticulitis

: Signs of carcinoma coli

(D) **Fistulous syndrome: Secondary infection**

(a) External: faecal fistula

(b) Internal: vesico or vagino-colic

(E) **Latent syndrome: 5% cases over 45 years**

: Diverticulosis: X-Ray appearances

Signs: X-Ray: barium enema

(1) Serrated margin of colon

(2) Round spots outside the colonic lumen:

: After evacuation of the enema

Treat: (1) **Conservative: Dietetic, laxatives, irrigations**

↓ (2) **Operative: Two stage**

(A) Transverse colostomy or caecostomy

↓ (B) Resection with anastomosis

or (C) Treatment of complications

(IV) SPECIFIC DISEASES OF THE INTESTINES:**(1) INTESTINAL TUBERCULOSIS:**

(A) **Miliary tuberculosis:**

(a) Ascitis

(b) Acute peritonitis

} : with miliary tubercles
all over the serous coat

(B) Tuberculous ulceration :

Etio : Milk or ingested sputum

Site : Lower ileum

Morb anat . Multiple tuberculous ulcers .

: At right angles to long axis

Clinic : (a) Colicky pain with diarrhoea

(b) Doughy abdomen

(c) Tuberculous diathesis

Compl : (a) Chronic \rightarrow acute intestinal obstruction :

(a) Multiple strictures

(β) Adhesions

(γ) Kinks

(b) **Peritonitis :** Local or general

(a) Plastic

(β) Perforative

(c) **Fistulae :** External or internal

: Adhesion \rightarrow perforation \rightarrow abscess \leftarrow
fistula

(d) **Acute miliary tuberculosis :**

(a) Ascitis

(β) Peritonitis

Treat : (A) **Conservative :** Anti tuberculous

(B) **Operative :**

(a) Resection if local

(b) Ileo colostomy . short circuit

: Go above the highest stricture

(C) Hyperplastic ileo-cæcal tuberculosis :

Def : Chronic tuberculous hyperplastic inflammation of the cæcum and pericæcal tissues with ulcers, strictures, adhesions and polyposis

Etio : Males (? females) between 20 and 40 .

: Mohamedans

Path . Ileo cæcal hyperplasia, fibrosis and ulceration

Clinic . (a) Chronic intestinal obstruction

+ (b) Irregular, tender mass in rt. iliac fossa

Sign : (1) Barium enema . filling defect

(2) Barium meal . stasis

: (Rapid emptying in early stages)

Diff diag : (a) **Carcinoma cæcum**


(b) **Chronic appendicitis**

(c) **Regional ileitis**

(d) **Diverticulitis**

(e) **Actinomycosis**

- Compl (1) **Acute intestinal obstruction**
 (2) Faecal fistula
 (3) Perforation → peritonitis
 (4) *Generalised tuberculous peritonitis*
 Treat (a) Short circuit **Ileo transverse colostomy**
 Ind (a) Obstruction
 (β) Abscess
 (γ) Fistula
 ↓ (b) Resection (in one or two stages)
 (D) **Generalised tuberculosis of the colon**
 Clinic Chronic blood stained diarrhoea
 Diff diag (a) **Dysenteries**
 (b) **Ulcerative colitis**
 (c) Diverticulitis
 (d) Malignancy
 Treat General anti tuberculous
- (2) **INTESTINAL TYPHOID**
 (A) **Typhoid tympanitis and enteritis**
 Clinic (1) Diarrhoea }
 (2) Tympanitis } in the 2nd or 3rd week
 (3) Distension }
 Diff diag (a) Typhoid perforation
 (b) Acute abdomen
 Treat Medical
 (B) **Typhoid hæmorrhage**
 Clinic (a) Shock + pallor
 ↓ (b) Copious tarry stools
 Diff diag Other causes of intestinal hæmorrhage
 (1) Intestinal purpura
 (2) Acute intussusception
 (3) Mesenteric thrombosis
 Treat Repeated blood transfusions
 (C) **Typhoid perforation**
 Clinic (1) Sudden subnormal temp + shock
 (2) Local tenderness
 (3) Perforative peritonitis rigidity absent
 Time About the 3rd week but may be the 1st week
 Site Lower ileum
 Diff diag (1) Typhoid tympanitis and enteritis
 (2) Other causes of acute abdomen
 (3) Toxæmia
 Treat (1) **Exploratory laparotomy** •
 Under local anæsth
 ↓ (2) Explore the lower ileum

- 
- ↓ (3) Suture the perforation
 - ↓ (4) **Look for and treat other perforations**
 - ↓ (5) Peritoneal toilet + drainage
 - ↓ (6) Closure

Pre and post treat: (a) Blood transfusions
(b) Anti shock treatment.

(3) DYSENTERY:

Etio: *Entamoeba histolytica*

Path: Undermined, irregular, worm eaten ulcers:
: In the descending and pelvic colon

Clinic: Blood with mucus in the stools

Sign: Amœbic ova in the stools

Compl: (1) **Hepatitis** or hepatic abscess

(2) Stricture

(3) Local abscess. (a) Intra peritoneal
(b) Extra peritoneal

Treat: (a) **Emetine**: gr. one subcut. for ten days
(b) Colonic irrigations. Pot. permanganate

(4) ACTINOMYCOSIS:

Site: Cæcum + right iliac fossa

Clinic: (a) Persistent sinus after appendicectomy
(b) Right iliac. irregular tumour + multiple
sinuses + sulphur granules
(c) Actinomycotic pyæmia

Diff diag: (1) **T. B. Cæcum**
(2) **Carcinoma cæcum**
(3) Chronic appendicitis
(4) Regional ileitis
(5) Diverticulitis

Compl: Actinomycotic liver

Treat. (a) Pot. iodide; sulphonamide
(b) Scraping, excision
(c) X Rays

(V) INTESTINAL ULCERATION:

(A) *Small intestine*:

(1) PEPTIC ULCER.

Sites: (a) Anastomotic
(b) **Jejunal**
(c) Meckel's diverticulum

Clinic: (1) Ulcer symptoms
(2) Melæna or occult blood in stools

(2) TUBERCULOUS ULCER:

Site: Ileum

Morb anat **Transverse**; undermined; multiple
Studded with tubercles

Clinic (a) **Diarrhoea**
(b) **Chronic intestinal obstruction**

Compl **Stricture** (See above)

(3) **TYPHOID ULCER**

Site **Lower ileum** • Within 3' of ileo-caecal valve

Morb anat **Longitudinal**; acutely inflamed,
Ulcerated **Payr's patch**

Compl (1) **Perforation**
(2) **Hæmorrhage**

(B) *Large intestines*

(1) **ULCERATIVE COLITIS**

Site **Any part of the colon**

Morb anat **Variable sized, raised, irregular ulcers**
With **œdematous inflamed muc. mem**

Clinic (See above)

Compl (a) **Perforation**
(b) **Pericolitis**
(c) **Pseudo polyposis**
(d) **Stricture**

Treat (See above)

(2) **DYSENTERIC ULCERS**

Sites **Pelvic and descending colon**

Morb anat **Multiple undermined, irregular, worm eaten**

Clinic (See above)

Compl **Stricture** (See above)

Treat (See above)

(3) **STERCORAL ULCER**

Sites **Rectum pelvic colon, cæcum**

Morb anat **Patchy erosions of the muc mem**
Due to pressure of faecoliths

Clinic **Proctitis or colitis syndrome**

Compl **Perforation** → (a) **Pericolitis** → fistula
(b) **Peritonitis**

(4) **MALIGNANT ULCER**

Site **Anatomical or physiological stasis**

(a) **Rectum**

(b) **Sigmoid**

(c) **Splenic or hepatic flexure**

(d) **Cæcum**

Morb anat **Irregular, indurated, everted, infiltrating**

Clinic (See under **Malignant Growths**)

Compl **Chronic** → **acute intestinal obstruction**

- Treat: (a) Radical excision
 (b) Palliative: (a) Proximal drainage
 (β) Short circuit

(VI) STRICTURES OF THE INTESTINE:

(A) CONGENITAL ATRESIA OR STENOSIS:

- (1) Duodenum
- (2) Meckel's diverticulum
- (3) Junction of mid and hind gut: (in transverse colon)

(B) TRAUMATIC:

- (1) Rupture
- (2) Anastomosis: Post operative

(C) INFLAMMATORY:

- (1) Perforation
- (2) Strangulation

(D) ULCERATIVE:

- (1) T. B. intestines: Multiple strictures
- (2) Regional enteritis or colitis
- (3) Dysenteric
- (4) Ulcerative colitis
- (5) Diverticulitis
- (6) Typhoid
- (7) Malignancy

(E) NEW GROWTHS Carcinoma

Clinic: *Of intestinal stricture*

- (1) Chronic intestinal obstruction
- (2) Barium meal or enema

Compl: Acute or chronic intestinal obstruction

- Treat. (1) Resection and anastomosis:
 : One stage or two stage
 (2) Short circuit
 (3) Artificial anus

(VII) INTESTINAL OR FAECAL FISTULAE:

Def. An abnormal track leading from the intestinal lumen either to the surface of the body or to the lumen of another portion of the gut or any other viscera and conveying intestinal contents.

Varieties: (A) Artificial: Therapeutic

- (1) External: Entero or colo stomy
 - (a) Permanent: Spur
 - (b) Temporary: No spur
 - (a) Urgent: life saving
 - (β) Preliminary: two stage resection
- (2) Internal: Short circuit
 - (a) Permanent: Palliative
 - (b) Temporary: Preliminary to resection

(B) Natural Pathological**(1) External** Fæcal fistula**(2) Internal****(a)** Entero enteral**(b)** Entero visceral**(a)** Bladder**(β)** Vagina**Etiology (1) Congenital****(a)** Patent Meckel**(b)** Rectal malformations**(2) Traumatic****(a)** Accidental wounds**(b)** Operative tuberculosis

acute sepsis

malignancy

(3) Inflammatory (a) Appendicitis**(b)** Peptic ulcer**(c)** Strangulated hernia**(d)** T B intestines**(e)** Diverticulitis**(f)** Regional ileitis**(g)** Actinomycosis**(4) Malignant Carcinoma****(5) Operative (See under Entero and Colostomies)****Pathology Factors in keeping up the stoma****(1) Spur****(a)** A kink with opening at apex**(b)** Excluded loop with lateral opening**(c)** Excised loop with two openings**(d)** Upper limb stoma + lower limb closure**(2) Distal obstruction****(a)** Growth**(b)** Infection**(c)** Fibrosis**(3) Nature of the etiology****(a)** Tuberculosis**(b)** Carcinoma**(c)** Actinomycosis**(4) Irritative discharges****(a)** Paracystico-biliary**(b)** Jejunio ileal**(c)** Urine**(d)** Pus

Diagnosis: (1) Diagnosis of the fistula :

: Passage of intestinal contents :

- (a) Digestive ferments
- (b) Stercoraceous or stercorous material
- (c) Odour :
 - (a) Faecal odour does not mean faecal fistula
 - (β) Faecal fistula does not mean faecal odour

(2) Diagnosis of the level :

- (a) Position
 - (b) Physical characters :
 - (a) Consistency
 - (β) Odour
 - (γ) Colour
 - (c) Condition of the stoma and surroundings
- Levels: (a) High enteric: jejunal
 (β) Low enteric: ileal
 (γ) Colonic: colon

(3) Diagnosis of the etiology :

- (a) History
- (b) Clinical examination
- (c) Laboratory examination

Compl: (1) Irritative inflammation of the surroundings**(2) Cellulitis or gangrene****(3) Inanition cachexia: in high fistulae****Treat: (A) Conservative :**

- Ind: (1) Temporary fistulae with no spur
 (2) Absence of distal obstruction
 (3) Low position
 (4) Stoma lined by granulations
 (5) Small stoma
 (6) Acute stage

- Tech: (a) Constipating low residue diet
 (b) Medicines: Bismuth cum opio
 (c) Dressings: Protective
 (d) Irrigations: Of the limbs
 (e) General or specific therapy
 (f) Mechanical methods
 (a) Beck's paste or chewing gum
 (β) Button or plaque closure
 (γ) Love's obturator method

(B) Operative :

- Ind: (1) Fistulae with spur
 (2) Presence of distal obstruction
 (3) High position of fistulae
 (4) Failure of conservatism
 (5) Failure of conservatism

Contraind Irremovable distal obstruction :

- (a) Which cannot be short circuited
- (b) Where too much bowel has to be short circuited

Tech (1) Enterotome application to the spur :

Ind Artificial anus

Time Six to eight weeks after

- (2) Lateral purse-string closure
- (3) Lateral suture
 - Linear, transverse to the axis
- (4) Extra-peritoneal resection and closure
- (5) Intra peritoneal resection and closure
- (6) Complete resection and closure
- (7) Intestinal exclusion :
 - (a) Partial bilateral
 - (b) Complete : (a) Unilateral
 - (β) Bilateral

(VIII) NEW GROWTHS OF THE INTESTINES :

(A) TUMOURS OF THE SMALL INTESTINE

(a) *Innocent*

(1) Adenoma

Etio • Children

Path Single or multiple

Clinic Colicky pain

Sign Barium meal

Compl (a) Intussusception

(b) Malignancy

Treat Excision

(2) Papilloma

(3) Lipoma

(4) Fibroma

(b) *Malignant*

(1) Carcinoma

Site Jejunum → ileum

Clinic (1) Intermittent partial obstruction

(2) Progressive anaemia and cachexia

(3) Occult blood in the stools

(4) X Rays normal stomach and colon

Treat Resection

(2) Sarcoma

(B) TUMOURS OF THE COLON •

(1) *Innocent* .

POLYPOSIS OF THE COLON .

Etio : Hereditary and familial

Age : Younger with each generation under 40

Path : (A) Single

(a) Pedunculated adenoma

(b) Villous papilloma

(B) **Diffuse papillomatosis or adenomatosis**

Clinic : (1) Signs of severe colitis :

(a) Pain

(b) Bleeding

(c) Diarrhoea

(2) Debility

(3) History

Signs : (a) Barium enema

(b) Sigmoidoscopy

Diff. diag : Pseudo polyposis of ulcerative colitis

Compl : (1) Intussusception

(2) **Malignancy**

Treat : (A) **Resection :**

(a) Local growth

(b) Local segment

(B) **Diathermy :** In low polyposis

. Through the sigmoidoscope

Post. treat : Re examine every four months

(2) *Malignant :*

: **CARCINOMA COLON** .

Etio : (a) Men between 50 and 70

(b) **Young age in :** (a) **Cæcum**

(β) **Sigmoid**

(γ) **Polyposis**

Sites : (1) **Rectum**

> (2) **Sigmoid**

> (3) **Cæcum**

> (4) **Hepatic flexure**

> (5) **Splenic flexure**

Path : **Columnar celled adeno carcinoma :**

(a) **Annular stricture .**

: **Most malignant**

(b) **Tubular stricture**

(c) **Ulcerative**

(d) **Formative :**

. Encephaloid } : **Least malignant**

. Cauliflower }

(e) **Infiltrating**

(f) **Colloid**

Spread : (A) **Local :**

(a) Round the lumen . stenosis

(b) Pericolic adhesions

(B) *Lymphatic* :

: Epicolic → paracolic → intermediate →
para aortic → receptaculum chyli →
thoracic duct → left supra-claviculars

(C) *Blood stream* :

: Liver

(D) *Trans coelomic* :

- (a) Malignant peritonitis
- (b) Krukenberg tumours
- (c) Pouch of Douglas

Clinic : (a) *Age* :

- (a) Between 50 and 70
- (β) Young adults . sigmoid
(Personal case . Plump, young English lady about 20)

(b) *Chronic intestinal obstruction* :

- (a) 'Dyspepsia'
- (β) Altered bowel habit .
(1) Constipation
(2) Diarrhoea

(c) *Colitis* : Blood and mucus per anum(d) *Tumour* :

- (a) Local : palpable or sigmoidoscopy
- (β) Metastatic

(e) *Cachexia and anæmia*

: Sometimes absent, especially in the young (see above)

Signs : (1) *Stools* : Blood or growth pieces or cells(2) *Barium* : Enema or meal
· Filling defect(3) *Sigmoidoscopy*Clinical syndrome : (A) *Right colon carcinoma* :

- (a) Appendicular syndrome
- (b) T. B cæcum syndrome
- (c) Colitis syndrome
- (d) Metabolic disease syndrome

(B) *Left colon carcinoma* :

- (a) Chronic or acute obstructive
- (b) Ulcerative : Colitis
- (c) Formative : tumour

Diagnosis : (1) *Slightest change in bowel habit*

- (2) *Any obscure loss of health* :
: Pass in the sigmoidoscope
: Do barium enema

- Diff. diag :**
- (1) Inflammations of the intestines
 - (2) Obstructions of the intestines
 - (3) Intra abdominal tumours
 - (4) General diseases : anaemia
 : diabetes

- Compl: (1) Acute or chronic intestinal obstruction
(2) Perforation → (a) Peritonitis
(b) Retro peritonitis
(c) Faecal fistula:
(α) External
(β) Internal
(3) Intussusception

Treat : Operation :

- Ind : (a) Presence of complications
(b) Operability
(c) Palliative: In inoperable growths

- Inoperable : (1) Local . adhesions, bad place
 (2) Regional : irremovable basal glands
 (3) Distant : liver, peritoneum, pelvis
 : supraclaviculars
 (4) General : cachexia

(1) *Carcinoma with complete obstruction:*

: Only treat the obstruction and do no more

- (A) *Expectant*: Acetyl choline
↓ Small enema

↓ (B) *Surgical drainage:*

- (a) **Cæcostomy:** Blind

Ind : Urgent life saving

- (b) Proximal colostomy:

Ind : (α) Local distension

(β) Irremovable growth

(II) *Carcinoma with partial obstruction :*

- (1) *Partial obstruction with operable growth:*

- (A) *Two stage :*

- (a) Relieve the obstruction.

- (a) At or below the hepatic flexure:
• Cæcostomy

- (β) Cæcum or ascending colon:
: Ileo transversostomy

- ↓ (b) Radical removal: 'With anastomosis'

- (B) *Three stage*. Paul Mikulicz

- (a) Exteriorisation of the growth

- ↓ (b) **Excision of the growth**

- ↓ (c) Restoration of continuity of lumen

- (2) *Partial obstruction with inoperable growth:*

- (A) *Permanent artificial anus*

(B) *Lymphatic*

- Epicolic → paracolic → intermediate → para aortic → receptaculum chyli → thoracic duct → left supra claviculans

(C) *Blood stream*

Liver

(D) *Trans cœlomic*

- (a) Malignant peritonitis
- (b) Krukenberg tumours
- (c) Pouch of Douglas

Clinic (a) *Age.*

- (a) Between 50 and 70
- (β) Young adults sigmoid
(Personal case Plump, young English lady about 20)

(b) *Chronic intestinal obstruction.*

- (a) 'Dyspepsia'
- (β) Altered bowel habit
 - (1) Constipation
 - (2) Diarrhœa

(c) *Colitis.* Blood and mucus per anum(d) *Tumour.*

- (a) Local palpable or sigmoidoscopy
- (β) Metastatic

(e) *Cachexia and anæmia*

Sometimes absent especially in the young (see above)

Signs (1) *Stools:* Blood or growth pieces or cells(2) *Barium:* Enema or meal
Filling defect(3) *Sigmoidoscopy*Clinical syndrome (A) *Right colon carcinoma*

- (a) Appendicular syndrome
- (b) T B cœcum syndrome
- (c) Colitis syndrome
- (d) Metabolic disease syndrome

(B) *Left colon carcinoma*

- (a) Chronic or acute obstructive
- (b) Ulcerative Colitis
- (c) Formative tumour

Diagnosis. (1) *Slightest change in bowel habit*(2) *Any obscure loss of health:*

- . Pass in the sigmoidoscope
- : Do barium enema

(B) *Short circuit :*

- (a) Cæcal or ilio-cæcal growth :
: Ileo transversostomy
- (b) Hepatic flexure growth :
 - (α) Cæco sigmoidostomy
 - (β) Ileo sigmoidostomy
- (c) Transverse colon or splenic flexure growth
 - (α) Permanent proximal colostomy
 - (β) Colo colostomy local short circuit
 - (γ) Ileo sigmoidostomy + cæcostomy

(III) *Carcinoma with no obstruction :*(1) *No obstruction with operable growth :**Radical operation .*(a) *Resection of :*

- (1) Adequate amount of growth
- (2) Healthy segment above and below
- (3) Segments with precarious blood supply
- (4) Corresponding mesentery
- (5) Complete lymph area

↓ (b) *Restoration of intestinal lumen*(2) *No obstruction with inoperable growth*

- (a) *Short circuit* in higher growths
- (b) *Permanent colostomy* . lower left colon

(A) *Tumours of right colon*

- (1) Inoperable Ileo transversostomy
- (2) Operable (a) Ileo-transversostomy
↓ (b) Resection

(B) *Tumours of the left colon*

- (1) *With acute obstruction .*
 - (a) Inoperable growth
 - (α) Proximal permanent colostomy
 - or (β) Cæcostomy
 - ↓ Short circuit
 - (b) Operable growth
 - Cæcostomy
 - ↓ Resection
- (2) *With no obstruction*
 - (a) Inoperable growth
 - (α) Cæcostomy
 - ↓ Short circuit
 - (β) Proximal permanent colostomy
 - (i) Operable growth
 - Multi-staged operation
 - (α) Exploration → cæcostomy
 - ↓ (β) Resection → anastomosis
 - or (γ) Paul Mikulicz

(IX) SPECIAL AFFECTIONS OF THE INTESTINES:

- (1) Cystic pneumatosis
 Site Small intestine
 Morb anat Clusters of gas containing cysts
 (2) Melanosis coli
 Def Grey to black pigmentation of the colon
 Etio Constipation
 With anthracene laxative habit
 Site Ileo-cæcal valve to anal canal
 Path Melanin in the large mononuclear cells of the muc mem
 Clinic (a) Obstinate constipation
 (b) Anthracene purgatives
 (c) Sigmoidoscopy
 Treat (1) Unirritating diet
 (2) Leave off the anthracene purges
 (3) Liquid paraffin

(X) INTESTINAL OBSTRUCTION

- Path types (1) Simple obstruction
 Blockage of lumen at one point
 (2) Closed loop obstruction
 Blockage of lumen at two points
 + Imprisonment of intervening loop contents
 (3) Strangulation
 (a) Obstruction of (a) Lumen
 + (b) Circulation
 + (c) Nerve conduction
 ↓ (b) Endangered viability of affected segment
 (4) Adynamic or paralytic ileus
 Nervous inhibition leading to paralysis of the
 intestinal peristalsis due to
 (a) Intestinal exhaustion
 (b) Nervous lesions
 (c) Toxæmias
- Clinical types (1) Acute
 (2) Chronic
 (3) Acute on chronic
- Situation types (a) High small gut
 (b) Low small gut
 (c) Large gut
- Classification Of types and causes of intestinal obstruction
 (A) Simple obstruction Blocked lumen
 (1) High small gut
 Causes (a) Acute dilatation of the stomach
 (b) Congenital pyloric stenosis
 (c) Foreign bodies

(d) Spasm

(e) Post-operative jejunal obstruction

(2) Low small gut :

Causes : (a) Adhesions : (α) Post inflammatory
 (β) Post operative
 (γ) Post traumatic

(b) Stricture

(c) Foreign bodies

(d) Gall stones

(e) Spasm

(f) Paralytic ileus

(3) Large gut :

Causes (a) Carcinoma : 70 %
 (b) Diverticulitis : 10 %
 (c) Faecal impaction : 10 %
 (d) Stricture
 (e) Congenital atresia
 (f) Spasm
 (g) Hirschsprung

(B) *Closed loop obstruction :*

(a) Obstructed hernia

(b) Volvulus

(C) *Strangulation :*

(1) Internal strangulation :

Causes . (a) Bands : (α) Peritoneal
 (β) Omental
 (γ) Visceral
 (b) Orifices :
 (α) Internal hernia
 (β) Holes in omenta and mesenteries
 (c) Volvulus : (α) Small gut
 (β) Sigmoid
 (γ) Caecum
 (d) Intussusception . (α) Primary
 (β) Secondary
 (e) Infarction : (α) Embolism
 (β) Thrombosis
 (γ) Trauma

(2) External strangulation :

Causes : Hernia : (a) Inguinal
 (b) Femoral
 (c) Umbilical
 (d) Others

Path. causes : (1) Pressure on bowel from outside :

(a) External hernia
 (b) Bands and adhesions

- (c) Internal hernia
- (d) Glandular or tumour pressure
- (2) Diseases of the bowel wall :
 - (a) Intussusception
 - (b) Volvulus
 - (c) Kink
 - (d) Stricture :

- (1) Traumatic
- (2) Perforation
- (3) Hernial
- (4) Tuberculous
- (5) Dysenteric
- (6) Malignant
- (e) Growths : Carcinoma
- (f) Paralysis

- (3) Lumen obstructions :
 - (a) Gall stones
 - (b) Faecal impaction
 - (c) Foreign bodies
 - (d) Worms : Ileus verminosis

- Pathology : (A) General toxæmia : Theories
- (a) Proteose toxins
 - (b) Bacterial toxins . B Welchii
 - (c) Dehydration loss of fluids
 - (d) Alkalosis loss of chlorides
 - (e) Circulatory failure
 - (f) Azotæmia
 - (g) Retention of nitrogenous products
- (B) General shock : Peritonism
- (C) Local changes :

- (a) Obstruction
- ↓ (b) Congestion
- ↓ (c) Strangulation
- ↓ (d) Paralysis
- or (e) Perforation
- or (f) Gangrene
- ↓ (g) Peritonitis

- Morb anat : (A) Simple obstruction :
- (1) Proximal distension
 - (2) Local stenosis
 - (3) Distal contraction
- ↓ (B) Strangulation :

- (1) Rapid distension : Co₂
- (2) Vascular obstruction :
 - (a) Congestion → bleeding :
 - (α) Lumen
 - (β) Peritoneal

- ↓ (b) Infarction
- ↓ (c) Gangrene
- (3) Nervous obstruction * ileus
- + (C) **Changes outside the bowel :**
 - (1) Exudate
 - (a) Serous
 - (b) Hæmorrhage strangulation
 - (c) Purulent infection
 - (2) Lung complications vomit aspiration
 - (3) Dehydration
 - (4) Toxæmia
- Morb physio (A) **Simple obstruction :**
 - (1) *High small gut*
 - (a) **Dehydration**
 - (b) Blood changes
 - (α) Fall in chlorides
sodium
bicarbonates
 - (β) Anhydræmia
 - (γ) Alkalosis
 - (c) Renal failure anuria → uræmia
 - (2) *Low small gut*
 - (a) Proximal distension fluids + gases
 - ↓ (α) **Toxic absorption**
 - (β) Nervous shock peritonism
 - (b) Sudden decompression
 - { (α) Toxic absorption
 - { (β) Splanchnic stagnation
 - { (γ) Mesenteric shock
 - ↓ Collapse and death
 - (3) *Large gut*
 - Gradual culmination of chronic obstruction
- Strangulation :**
 - (1) **Necrosis :**
 - ↓ (a) Perforation
 - or (b) Gangrene
 - ↓ (c) Peritonitis
 - (2) **Shock .**
 - (a) Initial traumatic mesenteric
 - ↓ (b) Latent instability of B P
 - ↓ (c) Terminal
 - (α) Loss of blood
 - (β) Nervous
 - (γ) Toxic
 - (3) **Bacterial toxæmia :**
 - (a) Peritonitis
 - (b) Long loop
 - (c) Long time

Syndrome: (1) *Symptomatic syndrome:*

(A) **Acute (primary):**

: Obstructive acute abdomen:

- (1) Shock
- (2) Vomiting
- (3) *Absolute constipation*
- (4) *Colicky pains*
- (5) Tympanitis

(B) **Acute (secondary to chronic):**

• Obstructive chronic → acute abdomen •

- (1) Signs of (A)
- + (2) *Visible peristalsis*

(C) **Chronic:**

- (1) Constipation with diarrhoea
- (2) Intermittent colic with vomiting
- (3) *Visible ladder pattern peristalsis*

(2) *Situation syndrome*

(A) **High small gut:**

- (1) *Sudden and rapid course*
- (2) Shock + +
- (3) *Vomiting early and* + +
- (4) *Rapid dehydration*
- (5) Absolute constipation . —
- (6) Distension: —

(B) **Low small gut:**

- (1) *Colicky pains* . + +
- (2) Vomiting after a time and + +
- (3) *Absolute constipation*
- (4) Central distension
- (5) Ladder pattern •
- If acute on chronic

(C) **Large gut:**

- (1) Slow course
- (2) Shock: —
- (3) *Vomiting late and* —
- (4) *Absolute constipation:* + +
- (5) Distension early and + +:
- (a) *Ballooned rectum*
- (b) *Distended caecum* ,
- (6) P.R.

(3) *Degree syndrome:*

(A) **Simple obstruction:**

- (1) Gradual onset
- (2) Shock: —
- (3) Slow course

(B) Strangulation :

- (1) Sudden onset
- (2) Shock . + +
- (3) Rapid course
- (4) Tender and rigid abdomen.

(4) Causative syndrome :**(A) Mechanical :**

- (a) Presence of an etiology
- (b) Colicky pains
- (c) *Borborygmi audible*
- (d) Visible peristalsis if chronic

(B) Paralytic :

- (a) Presence of an etiology
 - (a) Hæmatoma .
Splanchnic or mesenteric
 - (β) Operative or accidental trauma
 - (γ) Strangulation bowel
 - (δ) Late peritonitis
- (b) *Absence of pain*
- (c) *Dead silence on auscultation*
- (d) *Rapid and pronounced distension*
- (e) Reaction to
 - (α) Spinal anæsthesia
 - (β) Hypertonic saline
 - (γ) Acetyl-choline

Diff diag (1) Any other cause of acute abdomen :

- (a) Traumatic
- (b) Inflammatory
- (c) Perforative

(2) Referred abdomen :

Pseudo acute abdomen

(3) Medical abdomen :

- (a) Colics
- (b) Typhoid
- (c) Abdominal influenza
- (d) *Purpura*

(4) Toxic abdomen :

- (a) Uremia
- (b) Diabetic coma

Causes Of obstruction at various ages**(A) Acute obstruction :****(a) Congenital**

- (1) Imperforate anus
- (2) Congenital occlusion of the ileum
- (3) Congenital duodenal occlusion
- (4) Hypertrophic pyloric stenosis

(5) **Volvulus neonatorum :**

. Personal case volvulus neonat
+ mesenteric cyst

(6) **Exomphalos**(7) **Strangulated umbilical hernia**(b) *Infants.*(1) **Congenital rectal abnormalities**(2) **Strangulated external hernia**(3) **Intussusception**(4) **Internal hernia**(c) *Children*(1) **Intussusception**(2) **Meckel's diverticulum**(3) **Bands and adhesions**(4) **Strangulated external hernia**(5) **Internal hernia**(d) *Adults.*(1) **Strangulated external hernia**(2) **Volvulus : Small intestines**(3) **Bands and apertures**(4) **Internal hernias**(5) **Gall stone or faecal impaction**(6) **Pressure of tumours**(7) **Intussusception**(e) *Seniles*(1) **Carcinoma**(2) **Strangulated external hernia**(3) **Volvulus : Colon**(4) **Intussusception**(5) **Faecal incarceration**(B) **Chronic obstruction :**(a) *Children.*(1) **Adhesions :**

Tuberculous or peritoneitic

(2) **Tuberculous intestines**(3) **Tapes mesenterica**(4) **Chronic intussusception**(5) **Hirschsprung**(b) *Adults.*(1) **Peritoneal adhesions**(2) **Cicatrical stricture**(3) **Carcinoma**(4) **Ileo-caecal tuberculosis**(5) **Extrinsic tumour pressure**(c) *Seniles.*(1) **Carcinoma**(2) **Faecal impaction**

- (3) Chronic intussusception
- (4) Diverticulitis
- (5) Extrinsic tumour pressure
- (C) **Acute-on chronic obstruction :**
 - (1) Block to the lumen
 - (2) Kink or adhesions
 - (3) Paralysis
 - (4) Chronic local foci :
 - (a) T. B caecum
 - (b) Carcinoma caecum or colon
 - (c) Diverticulitis

Treatment Of intestinal obstruction

(1) *Degree treatment*

(A) *Simple intestinal obstruction*

(1) **Anti shock treatment : 2 to 3 hours**

(a) Warmth

(b) Morphia

(c) Continuous intravenous saline

+ (2) **Gastric and duodenal suction drain :**
Ryle's tube

(B) *Strangulation*

(1) **Anti shock treatment**

↓ (2) **Exploration :**

(a) Invagination if limited

(b) Resection + anastomosis condition good

(c) Exteriorisation + drainage condition bad

(C) *Paralytic ileus*

(1) **Continuous gastro duodenal suction drain**

(2) **Morphia : Small and repeated doses**

(3) **Continuous intravenous saline drip :**
4 pints a day for 3 days

(2) *Site treatment*

(A) *High small gut obstruction*

(1) **Replacement of fluids and plasma salts :**

(a) Intravenous (α) Hartmann's solution
(β) Glucose saline

(b) Subcutaneous saline

(2) **Gastro duodenal suction : siphonage drain**

(3) **Balance the fluid lost and taken**

(B) *Low small gut obstruction*

(1) **Conservative :**

(a) Gastro duodenal suction drain

(b) Intravenous and subcutaneous saline

↓ (2) **Operative :**

(a) **Very urgent - blind enterostomy**
(if no strangulation)

- (b) Urgent: proximal enterostomy
(c) Non-urgent: Radical

(C) Large gut obstruction :

(1) **Conservative:**

- (a) Withhold oral food and fluids
- (b) Gastro-duodenal suction drain
- (c) Intravenous glucose saline
- (d) Repeated rectal tube or enemata

↓ (2) Blind: (a) Cæcostomy
or (b) Transversostomy:
: Wangenstein

Ind: Failure of conservatism for 48 hours

↓ (3) Radical operation :

Ind: After subsidence of acute attack

(3) **Clinical syndrome treatment :**

(A) Acute intestinal obstruction :

(1) **Urgent exploratory laparotomy:**

Pre oper. (a) Two enemata
(b) Duodenal suction
(c) Intravenous: saline, glucose, blood
(d) Anti gas gangrene serum

Tech: *Palpate the caecum:*

- (a) *Cæcum distended* :
: Cæcostomy only
- (b) *Cæcum collapsed* :
: *Explore for the etiology* :
 - (a) Distension + + :
: Proximal enterostomy
 - (β) Cause found and removable :
: Radical
 - (γ) Gangrene present :
 - (1) Primary resection
 - or (2) Exteriorisation
 - ↓ Secondary resection

(2) **Planned laparotomy:** After diagnosis

Tech: (a) Find out the cause
(b) Radical treatment
(c) Proximal drainage; if necessary

(B) *Acute or chronic intestinal obstruction:*

- (a) Condition bad: (x) Cæcostomy
(β) Proximal enterostomy
(γ) Proximal colostomy

- (b) Condition good:
 (1) Removable: (α) Excision
 ↓ (β) Drainage

- (2) Irremovable:
 (a) Permanent colostomy
 or (β) Short circuit + drain
- (C) *Chronic intestinal obstruction* :
- (1) Removable:
 (a) Primary excision + anastomosis
 (b) Short circuit
 ↓ Excision
- (2) Irremovable: (a) Short circuit
 or (b) Permanent colostomy
 (See under *Intestinal Operations* also)

CAUSES OF INTESTINAL OBSTRUCTION:

(1) CONGENITAL CAUSES:

- : Intestinal obstruction in the new-born
 : (See under *Congenital Malformations*)

Causes : (A) *Direct : Mal-development itself*

- Path. (a) Bands
 (b) Septa : (α) Partial
 (β) Complete
 (c) Atresia : (α) Partial
 (β) Complete
 (d) Absence of a segment

Sites: (1) Duodenum :

- Clinic : (a) Vomiting from birth
 (b) Bile in the vomit

- Treat : (1) Bailey's spigot method
 (2) Gastro enterostomy

(2) Ileum :

- Clinic : Low small gut obstruction :
 (a) Vomiting
 (b) Visible peristalsis
 (c) Distension

- Treat : (1) Bailey's spigot method
 (2) Ileo-colostomy

(3) Rectum : (See under Rectum)

(B) *Indirect : Effects of the mal-development :*

- (a) Exomphalos : (α) Complete
 (β) Partial
 : Leads to obstructed umbilical hernia
- (b) Mal-rotation or deranged rotation :
 : Leads to :
 (α) Volvulus neonatorum
 (β) Reversed rotation obstruction

(c) **Meckel's diverticulum :**

- : Leads to (1) Stricture
- (2) Band
- (3) Kink
- (4) Intussusception
- (5) Volvulus

(d) **Megacolon :**

- : Leads to neuro muscular obstruction

(2) **INTUSSUSCEPTION.**

Def : Invagination of a part of the intestine into the lumen of adjoining segment due to irregular peristalsis

Etio : (a) **Infantile :** Primary (α) Acute
(β) Chronic

(b) **Adult :** Secondary, chronic

(c) **Seniles :** Secondary, chronic

(d) **Death :** Retrograde, multiple

Causal theories :

(a) **Foreign body response** secondary

(b) **Local neuro muscular spasm :** primary

Varieties : (a) **Primary :** Irregular peristalsis

in (α) Infants

(β) Death

(γ) Lead poisoning

(b) **Secondary :** Foreign body reaction

in : (α) Growths

(β) Meckel's diverticulum

(γ) Henoch's purpura

Sites . (A) Gastro-enteric :

: Post gastro jejunostomy

: **Gastro-jejunal** retrograde

(B) **Enteric :** 10% ; adults , secondary
: **Ileo-ileal**

(C) **Entero colic :** 85% , infants ; primary

(a) **Ileo colic**

(b) **Ileo-cæcal**

(c) **Entero-ileocæcal**

(D) **Colic :**

(a) **Cæcal**

(b) **Appendicular**

(c) **Colo-colic**

Path . (1) **Receiving layer :** intussusciptiens

(2) **Returning layer** } . Intussusceptum

(3) **Entering layer** }

(4) **Neck :** joins receiving and returning layers

(5) **Apex :** joins entering and returning layers

(6) Mesentery :

- Between entering and returning layers
- Causes the horse shoe curvature

- Compl (1) Adhesions → irreducibility
 (2) Acute intestinal obstruction
 (3) Strangulation :

↓ (a) Perforation } → Peritonitis
 or (b) Gangrene }

Clinic. (A) Acute intussusception :

- (1) Fine, lusty, male infant
- (2) **Severe, recurrent intestinal colic**
- (3) Vomiting
- (4) Tenesmus with bloody stools
- (5) **Shock : Peritonism**
- (6) Firm, curved, periumbilical swelling :
 Intermittent appearance
 Varying consistency
- (7) Rectal examination positive or negative

(B) Chronic intussusception :

- (1) Recurrent intestinal colic
- (2) Diarrhoea with blood and mucus
- (3) Concave periumbilical swelling
- (4) Visible peristalsis
- (5) Rectal examination

(C) Acute-on-chronic intussusception :

Acute culmination of chronic intussuscept.

Sign Barium enema or meal in chronic cases

Diff diag (A) Acute :

- (1) **Acute enteritis or dysentery**
- (2) Intestinal purpura Henoch
- (3) Typhoid hæmorrhage
- (4) **Simple intestinal colic**
- (5) Other causes of acute intest. obstruction

(B) Chronic :

- (1) **Chronic dysentery**
- (2) Intestinal T. B or tubes mesenterica
- (3) **Prolapse rectum**
- (4) Other causes of chronic intest. obstruc.

Compl : (1) Strangulation :

- (a) Gangrene
- (b) Perforation
- (c) Peritonitis

(2) Paralytic ileus

Treat : (A) *Early cases :*

: Retrograde hydrostatic reduction :

- By . (a) Saline pressure
(b) Barium pressure

- Tech :** (1) Insertion of non-lubricated catheter in the rectum for 3 inches
(2) Saline reservoir 3.5 feet high
(3) Pinching of the buttocks
(4) Run in saline for 4 minutes
(5) Run it out
(6) Repeat

(B) *Late cases :* Operative

Pre-oper : Anti shock treatment

Anæsth : (1) General

- (2) Spinal 2 c.cs. stovaine in saline
 . Lateral position
 . Small needle
 . Between 2nd and 3rd lumbar
 : Do not allow the escape of fluid

Tech : (A) *Good general condition + reducibility :*

: Reduction :

- (a) **Squeezing :** Milk out ; *never pull*
(b) **Cope :** Finger method
(c) **Daw :** Forceps method
(d) **Brown :** Incision method

(B) *Good general condition + Irreducibility .*

- (1) *Inner layers irreducible or gangrenous :*
: Barker : Resection of intussusceptum through an incision in the intussusciens

- (2) *All layers gangrenous .*
: Excision of all three layers
+ Anastomosis :
(a) Without proximal drain
(b) With proximal drain

(C) *General condition bad .*

- (1) *No gangrene but irreducible :*
: Short circuit

- (2) *Gangrene :*
(a) **Rapid resection + limb drainage**
(b) **Exclusion + proximal stomy**

*Operations for irreducible intussusception **(1) **Enterostomy : Proximal**

Ind General condition very bad

(2) **Short Circuit :**Ind (a) General condition not good
+ (b) Irreducible but not gangrenous(3) **Resection :**Ind (a) General condition good
+ (b) Irreducible or gangrenousTech (1) Total resection
(2) Excision of the intussusceptum
(3) Anal resection low intussusceptionMethods { (a) Without proximal drainage
{ (b) With proximal drainage
{ (a) With end to end anastomosis
{ (b) With lateral anastomosisAfter treat (1) First 24 hours shock period
(a) Trendelenburg
(b) Hydrotherapy
(c) Nепenthe 1 m every 3 hours
(2) After 48 hours reaction periodPost compl (1) Shock
(2) Acute gastric dilatation
(3) Paralytic ileus
(4) Gangrene bowel → peritonitis

Sequelæ Annular stricture

(3) **VOLVULUS**

Def Axial rotation of a portion of alimentary tract on its mesenteric axis

Etiol (1) Robust adults in 3rd or 4th decade
Small intestine
(2) Seniles
Sigmoid colonPre disp (A) Congenital (a) Undue mobility
(b) Narrow pedicle
(B) Acquired (a) Adhesion
(b) Loaded lumen

Exciting Sudden effort

(A) **Volvulus neonatorum :**
(See above)(B) **Volvulus of the small intestines :**Etiol Robust adults of Indian farmer class
Common in Bombay and Poona

Path: Clockwise twist of the ileum

- ↓ (a) Obstruction
- ↓ (b) Congestion
- ↓ (c) Strangulation
- ↓ (d) Gangrene
- ↓ (e) Peritonitis
- ↓ (f) Paralytic ileus

Clinic: Acute low small intestine obstruction

Special: After exploration:

- (1) **Multiple tight band-like feel**
- (2) Terminal ileum and cæcum collapsed
- (3) **Terminal ileum coursing up** from the ileo-cæcal valve and disappearing behind a tight constriction

(C) Volvulus of the cæcum:

- (1) Acute intestinal obstruction
Enormous dilatation of cæcum
- (2) Chronic recurrent obstruction

(D) Volvulus of the sigmoid:

Etio. Constipated elderly men: Russia and Poland

Path: Anti clockwise twist of the sigmoid

Clinic: Acute large intestine obstruction:

- With.** (a) **Enormous left-sided distension**
 (b) Tenesmus and rectal ballooning
 (c) Inability to pass enema or rectal tube

Compl: Of volvulus

- (1) **Strangulation**
 - ↓ (a) Gangrene
 - (b) Perforation { → Peritonitis
- (2) **Paralytic ileus**
- (3) Toxæmia and dehydration
- (4) Recurrence

Treat (A) Volvulus of the small intestines:

Tech (1) Undo the twist

↓ (2) **Enterostomy:**
: If condition bad + no gangrene

or (2) **Resection + limbs drainage**
↓ **Secondary anastomosis:**
: If condition bad + gangrene

or (2) **Resection + immediate anastomosis:**
: If condition good + gangrene

or (2) **Simple undoing the twist:**
: If condition good + no gangrene

Post. compl: Shock: Due to evisceration

(B) Volvulus of the cæcum :

- (1) Detorsion \rightarrow cæceopy :
: Early cases
- (2) Detorsion \rightarrow (a) Cæcostomy
or (b) Appendicostomy
: Doubtful cases
- (3) Resection \rightarrow Ileo colostomy :
: Gangrene + general condition good
- (4) Exteriorisation \rightarrow proximal drainage :
: Gangrene + general condition bad

(C) Volvulus of the sigmoid :

- (1) Conservative :
: Rectal tube . (a) Knee elbow position
or (b) Sigmoidoscopic
- (2) Operative :
(A) No gangrene :
 (a) Early cases :
 . (a) Undo the twist
 + (b) Tie in long rectal tube
 (b) Marked distension :
 . (a) Tap the loop
 + (b) As in (a)
 (c) Paralysed loop :
 . (a) Untwist the loop
 + (b) Catheter drainage
(B) Gangrene :
 (a) General condition bad + + + :
 . (a) Exteriorisation
 + (b) Proximal drainage
 (b) General condition bad + + :
 : (a) Excision
 + (b) Drainage both ends
 (c) General condition bad + :
 (a) Bistal lateral anastomosis
 + (b) Apical drainage
 (d) General condition good :
 . (a) Excision
 + (b) Anastomosis
 + (c) Cæcostomy

(4) INTESTINAL KNOTS :

Etio Finland
Path Knots of mobile intestine
Clin c. Acute small gut obstruction

(5) BANDS, ADHESIONS AND APERTURES :**(A) BANDS -**

Etio. (1) Inflammatory :
(a) Peritoneal

- (b) Omental
- (c) Anatomical structures :
 - (α) Appendix
 - (β) Meckel's diverticulum
- (2) **Traumatic** : Post-operative adhesions
- (3) **Congenital** : Meckel's diverticulum
- Clinic : (α) **Past peritonitis or laparotomy**
- (b) Acute intestinal obstruction
- (c) **Blood** : (α) Hæmoperitoneum
- (β) Per rectum

(B) ADHESIONS :

- Etiology : (α) Inflamed intraperitoneal structure
- (b) **Plastic peritonitis** : T. B.
- (c) Diverticulitis or regional ileitis
- (d) Malignancy
- (e) **Post-operative** :
 - (α) Early : one to three weeks
 - (β) Late : months or years after
- Path : (1) **Local** : Appendix, salpinx
- (2) **General** : T. B. ; general peritonitis
- Mechanism : (1) Kinking
- (2) Compression
- (3) Distortion of lumen
- (4) Arrest of peristalsis
- (5) Volvulus
- Clinic : (1) Acute-on chronic obstruction
- (2) Chronic obstruction
- Special : (α) **History of previous trouble**
- (b) Visible peristalsis marked
- Complication : Recurrence

(C) APERTURES.

- Etiology : (1) Congenital
- (2) Traumatic
- (3) Operative
- Sites. (1) Mesenteric
- (2) Omental
- (3) Broad ligamental
- Clinic : Acute intestinal obstruction

Treat : *Of intestinal obstruction due to bands, adhesions, or apertures :*

- (A) General condition bad + no gangrene :
 - (1) Conservative
 - ↓ (2) Exploration + blind enterostomy

- (B) General condition bad + gangrene
 - (1) Exploratory laparotomy
 - ↓ (2) Exteriorisation + proximal drainage
 - or (2) Excision + limbs drainage
- (C) General condition good + gangrene
 - (1) Exploratory laparotomy
 - ↓ (2) Excision + anastomosis
- (D) General condition good + no gangrene
 - (a) Removable etiology
Remove (excision of the band)
 - (b) Irremovable etiology
Circumvent (short circuit)

(6) INTERNAL HERNIÆ

Varieties (A) Diaphragmatic (See under D-aphragm)

(B) Peri duodenal

- (a) Para-duodenal left duodeno-jejunal
Inferior mesenteric vein
- (b) Mesenterico-parietal right duodeno-jejunal
Superior mesenteric artery
- (c) Foramen of Winslow
 - (α) Portal vein
 - (β) Bile duct
 - (γ) Hepatic artery

(C) Peri-caecal

- (a) Superior ileo-caecal
Between meso appendix and mesentery
- (b) Inferior ileo-caecal ileo appendicular
Between fold of Treves and meso appendix
- (c) Retro-caecal

(D) Inter-sigmoid

(E) Pelvic

(F) Obturator

Clinic Acute intestinal obstruction with strangulation

- (1) High small gut peri-duodenal
- (2) Low small gut peri-caecal
inter-sigmoid

Special (a) Virulent course

(b) Toxæmia + +

(c) Hæmorrhage in lumen and peritoneum

Compl (1) Strangulation → gangrene } → peritonitis
↓ perforation

(2) Obstruction → paralytic ileus

(3) Toxæmia and dehydration

Treat (1) Reduction Without injury to (a) Contents
(b) Neck

↓ (2) Closure of the entry to the fossa

Tech (a) Reduction by manipulations

or (b) Decompression of the gut

↓ Reduction

+ (3) Treatment of obstruction

(7) **OBTURATION:** Lumen obstructions

Site: (1) Duodeno jejunal flexure: foreign body
 (2) Ileo-caecal junction: gall stone
 ; worms

(3) Cæcum } : fæcolith
(4) Sigmoid }

Age: (1) Children: (a) Worms
(b) Foreign bodies
(2) Fat females: gall stones
(3) Seniles: faecal impaction

Path: Obstruction \rightarrow impaction \rightarrow paralytic ileus

(A) **Foreign bodies:** (See under Gastro duod)

Etio: Children, hysterics, lunatics

Objects: Coins, toys

Sites (a) Duodeno jejunal flexure
(b) Ileo caecal valve

Clinic: (1) History or no history
(2) Recurrent colicky pains with vomits
(3) High or low small gut obstruction

Compl : Impaction

↓ (a) Obstruction → paralytic ileus

or (b) Ulceration \rightarrow perforation \rightarrow peritonitis

Treat (1) Non dangerous:

- Conservative

(2) Potentially dangerous:

: Observative

(3) Dangerous

: Operative

(B) **Worms:** *Ileus verminosus*

Etio : Children

Site . Lower ileum

Clinic. (1) History or no history of passing worms
(2) Acute low small gut obstruction

Compl: (a) Strangulation → peritonitis
(b) Perforation → peritonitis
(c) Obstruction → paralytic ileus

Treat: (1) Acute stage: conservative

↓ (2) Convalescence: santopin

(C) **Gall stones :**

Etio : Usually elderly females between 60 and 80 years

Path: (a) Cholelithiasis

↓↑ (b) Cholecystitis

↓ (c) Natural cholecysto-duodenostomy

↓ (d) Passage of gall stone into the intestine

↓ (e) Impaction in the lower ileum

Site: Lower part of the ileum

- Clinic: (1) Age and sex
 (2) History and signs of gall stone troubles
 (3) Recurrent colicky attacks with vomits
 (4) Acute low small gut obstruction:
 (a) Early, copious, stercoraceous vomits
 (b) Intermision of symptoms
 (c) Absence of distension

- Compl: (a) **Paralytic ileus**
 (b) Peritonitis
 (c) Heart failure: (Fatty heart)
 (d) Cholaemia : (Jaundice)

Treat: **Operative:**

- (A) Pre-operative (a) Gastro-duodenal suction drain
 (b) Intravenous glucose-saline
 (B) Operation (1) Laparotomy. right paraumbilical
 (2) Exploration of lower ileum
 (3) Extensisation and isolation of the loop
 (4) Milking the stone into normal part:
 (a) Proximal
 (b) Distal
 (5) Longitudinal incision
 (6) Extraction of stone
 (7) Empty the proximal intest.
 (8) Transverse suture
 (Do not meddle with gall bladder)
 (9) Closure

(D) **Faecal impaction:**

Etio Constipated seniles

- Path ↑ (c) Perforation → Peritonitis
 ↑ (b) Ulceration } → Diarrhoea
 ↑ (a) Irritation }
 : **Constipation**
 ↓ (a) Stagnation → Toxaemia
 ↓ (b) Obstruction } → Ileus
 ↓ (c) Impaction }

- Clinic (1) Obstinate chronic constipation
 (2) Chronic low small or large gut obstruction
 (3) Subacute intestinal obstruction

Speciul. Mouldable swelling in either iliac fossa

- Diff diag (a) Diverticulitis
 (b) Carcinoma

Treat: (A) **Conservative:**

- (1) Frequent glycerine enemias
 (2) Laxatives: liquid paraffin

↓ (B) Caecostomy: if acute obstruction

(E) **Enteroliths and stercoliths:**

Etio: Minerals, cellulose

mplications : Of obliteration or lumen obstruction

- (1) Enteritis
- (2) Stercoral ulcer
- (3) Perforation
- (4) Peritonitis
- (5) Obstruction
- (6) Paralytic ileus
- (7) Gangrene
- (8) Toxæmia . acute or chronic

(8) **STRICTURE OBSTRUCTIONS :**

Etio : (A) **Congenital atresia :**

- (a) Duodenal
- (b) **Meckel's diverticular**
- (c) Ileal
- (d) **Junctional : mid and hind gut**

(B) **Traumatic :**

- (a) Rupture
- (b) **Anastomosis : End to end**

(C) **Ulcerative :**

- (a) Typhoid
- (b) **Tubercle : Multiple strictures**
- (c) Ulcerative colitis
- (d) Regional ileitis
- (e) Dysenteric
- (f) Diverticulitis
- (g) **Strangulation : local**

(D) **New growths : Carcinoma (scirrhus)**

Path : (1) Stricture

- ↓ (2) Obstruction to contents
- ↓ (3) Irritation → œdema of the proximal part
- ↓ (4) Impaction of contents
- ↓ (5) Acute on chronic intestinal obstruction

Clinic : **Acute-on-chronic** intestinal obstruction :

- (a) History of etiology
- ↓ (b) Chronic obstruction
- ↓ (c) Recurrent subacute attacks
- ↓ (d) Acute on chronic obstruction

Treat : (A) *Condition bad*

: **Artificial anus**

(B) *Condition good :*

(a) *Removable etiology :*

: **Excision and anastomosis :**

- (α) One stage : without or with drainage
- (β) Two stage : (1) Drainage
- ↓ (2) Excision

(b) *Irremovable etiology :*

: **Short circuit**

(9) GROWTHS OF THE INTESTINES:

Etio : Carcinoma

. Old people

Sites . (a) Recto sigmoid, sigmoid
(b) Flexures splenic, hepatic
(c) Cæcum

Path (1) **Primary :** Due to growth itself
(2) **Secondary :** Due to
(a) Pressure
(b) Infiltration
(c) Adhesions
(d) Kinking
(e) Volvulus
(f) Intussusception
(g) Secondaries

Clinic (1) Seniles
(2) Chronic, recurrent intestinal obstruction
↓ (3) Acute on-chronic intestinal obstruction

Special (a) Mass in one of the common sites
(b) Secondaries

Compl (1) Perforative peritonitis
(2) Paralytic ileus

Treat (1) **Proximal drainage :** If condition bad
(2) **Short circuit :** If irremovable
(3) **Excision (two stage) :** If removable

(10) MESENTERIC THROMBOSIS.

Etio (a) Heart and blood vessels affections :

(α) Endocarditis

(β) Atheroma

(b) Local contusion

Path. (A) Arterial

(a) Primary vascular disease

↓ (b) Embolism

↓ (c) Secondary mesenteric thrombosis

↓ (d) Ischæmia of the bowel wall

↓ (e) Gangrene

(B) Venous

(a) Thrombosis due to

(α) Portal obstruction

(β) Peripheral sepsis

↓ (b) Vascular stagnation

↓ (c) Gangrene

Clinic : (1) Etiological disease
(2) Sudden virulent acute intestinal obstruction:
(a) Bloody stools
(b) Hæmo peritoneum

- (c) Early paralytic ileus
- (d) Early and profound shock
- (e) Prominent toxæmia

Treat · Immediate laparotomy ·

- Diagnosis** (a) Bloodstained effusion
 (b) Blue or purple gut
 (c) No mesenteric pulsations

- Tech** (1) **Resection of**
 (a) Infarcted segment
 + (b) Healthy margins
 Proximal and distal one foot
 + (c) Thrombosed mesentery

↓ (2) **Anastomosis**

(11) PARALYTIC ILEUS

Def. Loss of the propulsive power of the intestines due to paralysis of musculature

Etio (1) *Local causes*

(a) **Lesions of intestinal musculature :**

- Causes** (a) Over purgation
 In obstructive lesions
 (β) **Late stages of simple mechanical obstruction**
 (γ) **Strangulation**

- Path** (1) Ischæmia
 (2) Exhaustion

(b) **Changes in myo neural junctions :**

- Causes** (α) Traumatic shock
 (β) Anæsthesia

Path Destruction of acetyl choline

(c) **Lesions of Auerbach's plexus :**

- Causes** (a) Peritonitis
 (β) Strangulation
 (γ) Thrombosis
 (δ) **Toxic states**

- Path** (1) Inflammation
 (2) Ischæmia
 (3) Lowered sensibility

(d) **Sympathetic lesions :**

- Causes** (1) **Operative trauma**
 (2) **Peritoneal irritation**
 (3) **Peritonitis**
 (4) **Intestinal torsions → strangulation**

Path. Sympathetic irritation

(c) Post-operative ileus :

Causes (α) Anal spasm → meteorism → ileus

(β) Paralytic :

(1) Nervous

Exposure and trauma

(2) Mechanical exhaustion

(γ) Peritonitis · toxic

(2) *Referred causes* . Spinal paralysis :

(α) Traumatic

(β) T B

(3) *General toxæmias*

(a) Toxæmia Typhoid

(b) Septicæmia

(c) Uræmia

Morb anat (1) **Cessation of peristalsis :**

(a) Local

(b) General

(2) **Distension :**

(a) Local

↓ (b) Regional } (α) Small gut

↓ (c) General } (β) Large gut

(3) **Spasm of the sphincters :**

(a) Duodeno jejunal

(b) Ileo cæcal

(c) Recto sigmoid

(d) Anal

Clinic (A) *History*(1) **History of etiology :**

(a) Peritonitis

(b) Intestinal obstruction

(c) Operation

(d) General toxæmias typhoid

(B) *Local*(2) **Mild inhibition of peristalsis :**

24-72 hours

(a) Constipation

(b) Tympanitis

(c) Distension

(3) **Paralytic ileus :**(a) **Cessation of passage of flatus**(b) **Absence of peristaltic sensations**(c) **Absence of intestinal pain**(d) **Distension + +**(e) **Vomiting**

· (Variable according to position)

- (e) Dead silence on auscultation
- (f) Ballooned rectum
(If primary in large intestine)
- (C) *Referred*
 - (4) **Referred signs.**
 - (a) Respiratory embarrassment
 - (b) Cardiac embarrassment
- (D) *General*
 - (5) **Shock, toxæmia and dehydration**

Differential Diagnosis

<i>Symptoms and signs</i>	<i>Ileus</i>	<i>Obstruction</i>
Pain	Continuous or nil	Mechanical colicky
Vomit	+ +	+ +
Visible peristalsis	—	+
Audible peristalsis	—	+
Distension	Early and rapid	Late and slow
Course	Rapid	Slow
Toxæmia	+ +	— or slight
Peristaltic stimulants	Good effect	No effect
Hypertonic intravenous	Good effect	No effect
Spinal anaesthesia	Good effect	No effect

Compl (A) Local

- (1) Distension necrosis
- ↓ (2) Peritonitis

(B) Regional

Chest complications

(C) General

- (a) Dehydration
- (b) Uræmia
- (c) Toxæmia

Treat (A) **Preventive :**

(I) *Pre-operative prophylaxis*

- (a) Re-assurance
- (b) Have empty stomach and intestines
- (c) Avoid drastic purging
- (d) Morphine

(II) *Operative prophylaxis*

- (a) Avoid general anaesthesia
- (b) Avoid unnecessary trauma
 - (1) Unnecessary explorations
 - (2) Unsuitable incisions
 - (3) Forcible retractions

- (4) Rough handling of peritoneum
- (5) Evisceration and exposure
- (6) Dragging or tearing of mesenteries
- (7) Flushing of peritoneum
- (8) Denudation of peritoneal covering

(III) *Post operative prophylaxis*

- (a) Rest
 - (α) Morphia
 - (β) Nothing by mouth
- (b) Anal spasm
 - (α) Flatus tube
 - (β) Routine anal stretching
 - After every laparotomy
- (c) Vomit gastric drainage
- If persistent after 6 hours
- (d) Rectal hydrotherapy
- (e) Potter's preventive treatment
- Pitressin $\frac{1}{2}$ c.c. intramuscular
- B.D. for 8-12 days

(B) *Therapeutic*

(1) *Post operative meteorism*

- (a) Oil of turpentine min 1
- (b) R Aspirin grs. xv
- Soda bicarb dr $\frac{1}{2}$
- Sul volatile dr $\frac{1}{2}$
- Aqua menth pip ounce $\frac{1}{2}$
- (c) Flatus tube every four hours
- ↓ (d) Turpentine enema

(2) *Early cases (Within 24 hours)*

- (a) Morphine or heroin
- Small repeated doses
- (b) Nothing by mouth
- (c) Duodenal catheter
- (d) Intravenous glucose saline
- (e) Continuous heat to the abdomen

(3) *Established cases (After 24 hours)*

- (a) Drugs
 - (α) Morphine
 - $\frac{1}{2}$ gr every six hours
 - (β) Acetyl choline
 - 0.1 gm intramuscular
 - Hourly for 6 hours
- (b) Duodenal suction drainage
- (c) I.v. hypertonic saline drip
- To meet fluid requirements

- (α) 10% sod chloride
- (β) Ringer
- (γ) Hartmann
- (d) Enemata
 - (α) Ox bile injection
 - ↓ Turpentine enema
 - (β) Acetyl choline } → enema
 - + Hypertonic saline }
- (e) Spinal anæsthesia
 - Frees Auerbach from inhibitory influence of irritated sympathetic
- (f) Splanchnic anæsthesia
- (4) *Late cases Operation treatment*
 - Ind Failure of conservatism
 - 15 mins. after spinal anæsthesia
 - (A) *Early stages*
 - (a) Duodenal suction drainage
 - ↓ (b) Re opening the original incision
 - With treatment of focus
 - or (b) Low ileostomy
 - Through a stab wound
 - (B) *Late stages*
 - (a) Cæcostomy
 - (b) Blind enterostomy
 - Tech (a) Local anæsthesia
 - (β) Incision
 - Small left paraumb
 - (c) Short circuit
 - Jejuno transversostomy**
 - + Cæcostomy
- Post oper Stimulation of peristalsis
 - (1) Small repeated doses of morphia
 - (2) *Acetyl choline*
 - (3) I v hypertonic glucose saline
 - (4) Duodenal suction drain

XI) OPERATIONS ON THE INTESTINES

(A) PRE-OPERATIVE PREPARATIONS

- (1) Oral hygiene
- (2) Gastro intestinal hygiene
 - (a) Laxatives
 - (b) Intestinal antiseptics
 - (c) Gastric and colon washes

- (3) Peritoneal hygiene .
: Anti-gas-gangrene serum
- (4) Attention to
 - (a) Respiratory system
 - (b) Cardiac system
 - (c) Urinary system
- (5) Anti-shock preventive preparations
- (6) Paralytic ileus preventive measures
- (B) INDIVIDUAL OPERATIONS .

(1) ENTEROTOMY .

Def Incision into → treatment of internal focus → closure :
Of the intestines

- Ind (1) Removal of foreign bodies
(2) Emptying a distended coil

Tech (A) Foreign bodies .

- (1) Milking into proximal healthy part
- (2) Emptying and clamping
- (3) Isolation by gauze packs
- (4) Incision . (a) Longitudinal
+ (b) Anti mesenteric
- (5) Withdrawal of foreign body
- (6) Suture (a) Transverse
(b) Two layers
- (7) Closure

(B) Decompression

- (1) Isolation by clamps and gauzes
- (2) Purse string (a) Sero muscular
+ (b) Anti mesenteric
- (3) Trocar and cannula with rubber tube
- (4) Tighten the purse-string
- (5) No rough handling or milking

(2) ENTEROSTOMY

Def Temporary or permanent inlet to the intestinal cavity

- Ind. (1) Feeding Jejunostomy
(2) Drainage : (a) Ileostomy
(b) Caecostomy
(c) Transverse colostomy
(d) Left iliac colostomy

(A) JEJUNOSTOMY

- Ind. (1) Carcinoma lower end of oesophagus
(2) Extensive carcinoma stomach
(3) Gastro-duodenal ulcers :
(a) Extensive area
(b) Haemorrhage
(4) Cicatricial contraction of the stomach
(5) Gastro-jejunal or jejunal ulcers
(6) Gastro-jejuno-colic fistula
(7) Paralytic ileus on intestinal obstruction
(8) General peritonitis

Tech (a) Witzel

- (1) Local anaesthesia
- (2) Incision Left trans rectus
- (3) Palpate the duodeno jejunal flexure
- (4) Pack off jejunum 8 from the flexure
- (5) Incision anti mesenteric
- (6) Tube No 12 catheter
 - (a) Anchor stitch
 - (b) Bury along anti mesent border
Direct towards distal part
- (7) Omental Interposition
- (8) Intest to peritoneal fixation
- (9) Closure
- (b) Wangenstein's modification of Witzel
 - (1) Catheter scoring for anchor suture
 - (2) Burying the catheter into the wall before opening the intestine

(c) Ravdin

- (1) Incision
 - (a) Ant. axillary line
 - (b) Tip of 11th costal cartilage
 - ↓ (c) Downwards 2"
- (2) Muscle incision in line of (1)
- (3) Peritoneal opening
- (4) Clamp and isolate a jejunal coil
- (5) Stitch in No 14 catheter
- (6) Stitch the loop-apex to peritoneum
- (7) Closure

- After treat**
- (1) Glass connection → short rubber tube → bottle
 - (2) Run in soda bi-carb sol ounces VI at intervals
 - (3) Clamp the tube when no foul smell
 - (4) Remove the catheter on 10th day
 - (5) Emollient dressings to the surroundings

(B) ILEOSTOMY

Ind Drainage in Acute intestinal obstruction
Paralytic ileus
Regional ileitis

(1) Blind.

- (a) Very bad general condition
- + (b) Late small gut obstruction
- + (c) No strangulation

(2) Terminal or additional.

- (a) Small gut obstruction
- + (b) Obstructive cause dealt with
- + (c) No strangulation left in
- + (d) Paralytic ileus potential or actual

- Tech**
- (1) Removal of the cause of obstruction
 - (2) Withdraw → empty → clamp → pack off
Proximal coil at a distance from the focus

- (3) Open and insert the tube .
 - (a) Witzel method
 - (b) Purse string method
- (4) Omental interposition
- (5) Intesto peritoneal fixation
- (6) Closure

(C) CÆCOSTOMY

Ind (1) Drainage :

- (a) Life saving measure in (Blind)
 - (a) Acute large gut obstruction
 - (β) Paralytic ileus
- (b) Preliminary to or additional to
Large bowel resection or anastomosis
- (2) Irrigation
 - (a) Ulcerative colitis
 - (b) Dysentery
 - (c) Chronic colon obstructions
- (3) Fixation
Volvulus of the cæcum

Tech (1) Grid-iron incision

- (2) Peritoneal incision
- (3) Puncture of the cæcum with cannula
- (4) Isolation of the cæcum
- (5) Purse string
- (6) Cæco peritoneal fixation
- (7) Incision and insertion of
 - (a) Catheter
 - (b) Paul's tube
- (8) Ink bottling of catheter or Paul's tube
- (9) Closure
- (10) Continuous bottle drain

- Difficulties
- (a) Spontaneous perforation of the cæcum
 - (b) Gangrene of the cæcum
 - (c) Non mobile cæcum :
• Do transverse colostomy

- After treat
- (1) Skin protection with lanolin
 - (2) Drainage into the bucket
 - (3) If no drain, run in
 - (a) Water one pint every hour
 - (b) Mag sulph one ounce in water one pint
 At the end of 24 hours

(D) APPENDICOSTOMY

- Ind (1) Chronic colitis
- (a) Ulcerative
 - (b) Dysenteric
- (2) Obstinate chronic constipation
 - (3) Ileo-cæcal intussusception

(4) Caecal volvulus

(5) Paralytic ileus

Tech: (1) Anaesth: local, regional, general

(2) Incision: (a) Grid iron

(b) Stab

(3) Exteriorisation of appendix

(4) Caeco-peritoneal fixation

(5) Closure of the peritoneum:

: Around the appendicular base

(6) Appendico-aponeurotic fixation

(7) Excision of the protruding part of the appendix

: 4 days later

(8) Introduction of catheter

(E) TRANSVERSE COLOSTOMY:

Ind: (1) Blind: Life saving measure

: In acute large gut obstruction

(2) Carcinoma distal colon: (a) Splenic flexure

(b) Descend. colon

(c) Pelvic colon

(d) Rectum

: (a) As a temporary drainage:

: In operable growths

(b) As a permanent drainage

: In inoperable growths

(3) When caecostomy and left inguinal colostomy are impossible due to fixity

Tech: (A) Classical method.

(1) Incision:

: Left or right paramedian para umbilical

↓ (2) Bring out a loop of transverse colon:

: Through a hiatus in omentum

↓ Through the rectus muscle

↓ (3) Other steps: as in left iliac colostomy

(B) Wangenstein method:

(1) Small, local, transverse incision

(2) Exteriorisation of transverse colon loop

(3) Fixation to the skin

(4) Aspiration: immediate → 6 hours

(5) Open. after 24 hours

Advantages: (a) Faeces more solid than caecostomy

(b) More manageable than sigmoidostomy

(F) LEFT INGUINAL COLOSTOMY:

Ind: (A) Rectal lesions:

(a) Imperforate anus

- (7) Excision of appendices epiploicæ
- (8) Formation of stoma :
 - (a) Immediate
 - (b) Delayed : 3 days after
- (9) Excision of the projecting loop } 10th day
+ Withdrawal of glass rod

Methods of stoma :

- (1) **Paul : No spur method**
 - (a) Part of the circumference fixed to perit
 - (b) Open the colon in long axis
 - (c) Suture the colon margins to incision
- or (c) Tie in Paul's tube
- (2) **Two separate stomata**
- (3) **Madelung :**
 - (a) Transverse division of colon
 - (b) Closure and dropping in of lower segment
 - (c) Colostomy of the upper segment
- (4) **Lilienthal : Artificial sphincter**
 - (a) Transverse division of colon
 - (b) Axial rotation of upper end
 - (c) Tube tied in for one week

Time of stoma :

- (1) Immediate :
 - Ind : Complete obstruction
 - Tech : (a) Paul's tube method
 - (b) Rubber tube method
- (2) Delayed : after 2 or 3 days

Difficulties and errors of operation :

- (1) Difficulty of identification .
: Rectal injection of water
- (2) Anchored immobile colon .
: Mobilisation
- (3) Twist of the withdrawn loop
- (4) Neglect of colo peritoneal fixation
- (5) Solid faeces in proximal loop

Post. treat : (A) Management :

- (a) Opening the loop and tying in Paul's tube :
 - (a) Immediate
 - (β) 3rd day
- (b) Removal of glass rod
: 6th day
- (c) Excision of prolapsed bowel :
: 8th day
- (d) Removal of Paul's tube :
: When it comes out

(B) Diet :

- (a) Restrict the fluids
- (b) Dry, light, bland solids
- (c) Avoid : tomato, onion, fruit, cream

(C) Medicines : Astringents and antiseptics

- (a) Charcoal : B.D.
- (b) R. Bismuth salicylas
Salol
Betol } : āī grs. 5
- (c) Kerol m. iii in capsule B.D

(D) Bowels :

- (a) Aperient : as soon as bowel is opened
- (b) Bowel habit : morning enema
- (c) Irregularities :
 - (a) Constipation . laxatives
 - (β) Diarrhoea : pulv. specac. co
grs. 5 B.D.

(E) Wound :

- (a) Stoma :
 - (a) Irrigations of both openings : B.D.
 - (β) Colostomy appliances :
 - (1) Belt with wool pad (may be used)
 - (2) Belt with cup (not necessary)
- (b) Skin dressings :
 - (a) Dry powdering
 - (β) Starch + egg albumen + olive oil
- (c) Daily bath

Post compl. (A) Local intestinal :

- (1) **Prolapse** : Of small intestine or omentum
Clinic . Intestinal obstruction
Cause : Failure to fix colon to peritoneum
Prophylaxis : (a) Small incision
(b) Colo peritoneal fixation
- (2) **Strangulation** :
: Between colon & parietes
Treat : (a) Colostomy near ant. sup. spine
(b) Fixation of colon limb to parietes
- (3) **Gangrene** : Of outside loop
- (4) **Mesenteric phlebitis** → portal pyæmia

(B) Abdominal :

- (1) Paralytic ileus
- (2) Peritonitis

(C) Wound infection and sequelæ :

- (1) Abscess
- (2) Cellulitis
- (3) Gangrene

(4) **Extensive ulceration**

(5) **Ventral hernia :**

Causes : (a) Outer rectus incision

(b) Cup belt

(c) Straining

(D) *Stoma abnormalities :*

(1) **Tearing and falling in of stoma**

(2) **Stricture :**

Treat : Regular dilatation

(3) **Prolapse :**

Treat : (a) Small opening

(b) High opening

(c) Valvular opening

(d) No redundancy

(e) Rest

(f) Laxatives

(4) **Incontinence :**

Treat : (a) As in (3)

(b) Lilienthal method

(c) Trans-rectus method

(5) **Spur retraction**

(6) **Invasion by primary condition :**

: Carcinoma

(G) **INVAGINATION OF GANGRENOUS INTESTINES :**

Ind : Small localised or annular gangrenous patch

Contraind : (a) Gangrene $> 3^{\circ}$

(b) Œdematous wall

(c) Difference in proximal and distal lumen

Tech : (1) **Purse-string**

(2) **Linear -**

(a) Excision of V mesentery

(b) Tucking in by 4 angular sutures

(c) All round continuous suture

(d) Closure of mesenteric gap

Sequela : Stricture

(H) **ENTERECTOMY AND ANASTOMOSIS :**

Ind : (1) **Severe trauma to bowels &/or mesentery**

(2) **Gangrene of the bowels**

(3) **Carcinoma**

(4) **Tuberculosis : Localised**

(5) **Chronic inflammations : Local or regional**

(6) **Fæcal fistulæ**

Method : (1) **Enterectomy**

↓ (2) **Anastomosis :**

(a) **End-to-end : Closure of neither end**

(b) **End-to-side : Closure of lower end**

- (c) **Side-to end** : Closure of upper end
- (d) **Side to side** : Closure of both ends

Sites : For enterectomy

- (A) Upper healthy bowel well away from focus
- (B) Lower two inches below the focus
- (C) *Healthy blood supply to both segments*

Steps (1) Enterectomy :

Tech (a) Isolation of affected loop :

- By (a) Clamps
- (β) Packs

(b) Excision of fan shaped mesentery

(c) Resection of affected loop :
Between crushing clamps

(2) Anastomosis :

Tech (a) Posterior sero muscular suture

(b) All coats through and through suture

(a) Posterior

(β) Anterior

(c) Anterior sero-muscular suture

(d) Omental graft

(e) Union of mesentery

Types (A) End-to-end Closure of neither end

Ind Small intestine

(a) Complete serous coat

(b) Fluid contents

(c) Equal calibre

Adv Restoration of normal anatomy

Disadv (a) Disturbed nerve supply

(b) Stricture

(c) Mesenteric angle leak

Methods (1) Open method

(2) Closed methods

(a) Schoemaker

Sero-muscular method

(β) Fraser and Dott

Blind ends method

(γ) Pringle

Narrow blade forceps method

(B) End-to-side Closure of lower end

Ind (1) Small intestine

(2) Moynihan ante-colic gastrectomy

(3) Roux Y anastomosis

(4) Ileo-transversostomy

(5) Ileo-sigmoidostomy

(C) Side-to-end Closure of upper end

Ind Ileo-transversostomy

- Adv: (a) No axial rotation
 (b) No oedema of stoma
 (c) One blind end
 (d) Emptying by gravity
 (D) Side-to-side: *Closure of both ends*
 Ind: (a) Short circuit
 (b) Enterectomy · Isoperistaltic
 Adv: (1) Elimination of mesenteric angle
 (2) Stoma wider
 (3) Leakage less likely
 (4) Allows union of different sizes
 Disadv: (a) Longer time
 (b) Requires greater length
 (c) Distension → rupture of proximal blind end

(I) INTESTINAL EXCLUSION:

Def: Diversion of flow of contents away from the diseased part

- Ind: (1) Intestinal obstruction ·
 (a) Removable · as preliminary
 (b) Irremovable: as permanent
 (2) Faecal fistula
 (3) Colonic stasis

Varieties: (a) Temporary or preliminary · to excision
 (b) Permanent: as a palliative

Tech · (A) Bilateral partial ·

- Syn: (a) Lateral anastomosis
 (b) Short circuit
 Ind (1) Chronic obstruction:
 (a) Growth
 (b) Fibrosis:
 (α) Structure
 (β) Matting & adhesions
 (γ) Kinks
 (2) Faecal fistula
 (3) Gangrene bowel.
 : As an addition to:
 (a) Excision
 (b) Exclusion
 (c) Drainage
 (4) Recurring volvulus
 (5) Regurgitant vomit

Tech. Side to-side anastomosis without closure of either end

(B) Unilateral complete:

- Ind. (1) Artificial anus
 (2) Faecal fistula
 (3) Colitis
 (4) Irremovable growth of the colon
 (5) Ileo-caecal tuberculosis

- Tech (a) Complete division above the focus
 (b) End to side anastomosis below the focus
 (c) Closure or drainage of distal end

(C) Bilateral complete

Ind Faecal fistula

- Tech (1) Two divisions
 (a) Above the focus
 (b) Below the focus
 (2) Anastomosis proximal to distal
 (3) Closure or drainage of excluded loop

(J) COLECTOMY

Def Resection of the colon

- Ind (1) Carcinoma
 (2) Diverticulitis
 (3) Tuberculosis Cæcum
 (4) Faecal fistula
 (5) Ulcerative colitis
 (6) Benign growths

Extent *Of removal in radical resection for carcinoma*

- (1) Local (a) 3 inches above
 (b) The growth
 (c) 3 inches below
 (2) Regional (a) Lymph drainage
 (1) Epicolic
 (2) Paracolic
 (3) Intermediate
 (4) Main arterial
 (5) Para-aortic
 (b) Blood supply

Excision

Focus	From	To
Cæcum +Ascending colon	Last 6" of ileum	Beyond hepatic flexure
Hepatic flexure	Last 6" of ileum	Middle of trans. colon
Transverse colon	Proximal 3"	Distal 3"
Splenic flexure	Left 3rd of trans. colon	Middle of descending colon
Descending colon	Left 3rd of trans. colon	Middle of sigmoid
Sigmoid	Proximal 3"	Distal 3"

- Pre-oper (1) Investigate and treat
- (a) Cardio vascular system heart B P
 - (b) Blood hæmoglobin coagulation
 - (c) Respiratory system complications
 - (d) Urinary system kidney efficiency
 - (e) Alimentary system
 - (1) Mild laxatives
 - (2) Antiseptics and astringents
 - (3) Enemata and irrigations
 - (4) Diet (1) Plenty of fluids
 - (2) Carbohydrates +
 - (3) Proteins —
- (2) Special steps
- (a) Blood transfusion
 - (b) Glucose saline
 - (c) Intraperitoneal (α) Amniotic fluid
 - (β) Mixed vaccines
 - (d) Anti-gas gangrene serum
- Tech (1) Adequate exposure
- (2) Thorough mobilisation
 - (3) Adequate blood supply
 - (4) No tension
 - (5) Adequate protection to suture line
 - (6) Proximal drain if necessary
- Methods (A) *Paul Mikulicz 'Many Stage'*
- Ind (a) Growth between
- (α) Hepatic flexure
 - & (β) Terminal sigmoid
 - (b) Mobilisable colon
- Contraind (1) Non-exteriorisable colon
- (2) Unsatisfactory lymphatic removal
- Tech (1) Resection with drainage
- (a) Exposure by direct incision
 - (b) Thorough mobilisation
 - (c) Division of mesenteric vessels
 - (d) Exteriorisation of affected loop
 - (e) Proximal suture of two limbs
 - (f) Division and resection of growth
 - (g) Paul's tubes in both ends
- ↓ (2) Spurectomy 4 weeks later
- Clamping of the spur by enterotome
- ↓ (3) Closure of the faecal fistula
- (B) *Resection with end to-end anastomosis*
- Ind Acute-on-chronic obstruction
- Tech (1) Two stage (a) Preliminary drainage
- (α) Cæcostomy
 - or (β) Colostomy
 - or (γ) Short circuit
- ↓ (b) Resection + anastomosis

(2) One stage :

: Resection + anastomosis + proximal drainage :

: Drainage by (a) Caecostomy

(b) Proximal colostomy

(c) Over rectal tube

After treat : (a) If caecostomy : keep it for 3 weeks

(b) If no caecostomy : keep rectal tube for one week

(c) Liquid paraffin + glycerine enema :

. At the end of one week

Individual operation steps .

- | | | |
|-----------------------|---|---------------------|
| (1) Ileo-caecal valve | } | Two stage operation |
| Caecum | | |
| Ascending colon | | |
| Hepatic flexure | | |

Steps . (a) Exploration + ileo transversostomy

↓ (b) Resection :

(1) Incision :

(a) Right rectus

or (3) Muscle cutting right iliac

or (γ) Linea semilunaris

(2) Mobilisation of affected colon

(3) Exteriorisation of affected colon

(4) Ligature of ileo-colic art. and vein

(5) Division of ileum 6" from caecum

(6) Division of trans. colon beyond flexure

(7) Mobilisation and ligature of mesentery

(8) Removal of colon with mesentery

(9) Restoration of continuity .

(a) Side-to-end : closure upper end

(β) End to side : closure lower end

(γ) Lateral : closure both ends

(δ) End to-end : closure neither end

(10) Suture of iliac mesentery to mesocolon

(11) Drainage of peritoneum

Save (a) Ureter (b) Spermatic vessels

(2) Transverse colon :

Steps : (a) Clamping and division of colon :

. 3" both ways

(b) Incision and isolation of V mesocolon

(c) Division of greater omentum

(d) Removal of : (a) Affected colon

(β) Mesocolon with lymphatics

(γ) Greater omentum

(e) End to-end axial anastomosis

(f) Closure of gaps in mesocolon and omentum

(g) Caecostomy

(3) Splenic flexure and descending colon :

Steps . (a) Incision : (a) 6" long oblique :

: Below and parallel to costal margin

or (β) Tip of 11th rib to outer border of rectus
Parallel to intercostal nerve

- (b) Mobilisation By division of
 - (α) Ext peritoneal reflection
 - (β) Costo-colic ligament
 - (γ) Left gastro colic ligament
- (c) Resection of
 - (α) All intestine supplied by left colic artery
 - (β) Mesentery
 - (γ) Lymph drainage
- (d) Restoration of continuity by
 - (α) End to end } anastomosis of { (α) Transverse colon
 - or (β) Lateral } { (b) Upper sigmoid
- (e) Proximal drainage Cæcostomy
- (f) Local peritoneal drainage

(i) *Sigmoid flexure or iliac colon*

Tech (i) Two stage

- (a) Cæcostomy
- ↓ (b) Excision + anastomosis
 - (α) Preliminary mobilisation
 - (β) Resection
 - (γ) End to-end anastomosis
 - (δ) Peritoneal drainage

- Points (a) Cut the bowel 45° to the transverse diameter
 (b) Do not under run any vessels
 (c) Protect the anastomosis by appendices
 (d) Rectal tube

(ii) Paul-Mikulicz (See above)

(5) *Pelvic colon*

- Steps (1) Anæsthesia spinal + general
 (2) Position high Trendelenburg
 (3) Incision Left paramedian subumbilical
 (4) Exploration and examination of growth
 (5) Colo-parietal mobilisation
 (6) Ligature of inferior mesenteric artery
Below the first sigmoid branch
Above the lower sigmoid branches
 (7) Division of
 - (a) Mesentery
 - (b) Colon 3" both ways
 (8) Restoration of continuity by anastomosis
 - (a) End-to-end if lower end accessible
 - (b) Invagination over rectal tube
 If lower end inaccessible
 ↓ (c) Stretching of the anal sphincter
 or (c) Passage of a rectal tube
- or (8) Left inguinal permanent colostomy
 + (a) Removal of rectum and anus
 or (b) Closure of the lower end

- (6) *Pelvic rectal junction*
 Tech (1) Abdomino-perineal excision of rectum
 (2) Abdomino anal excision
 (3) Intra peritoneal excision of the rectum
 (4) Rutherford Morison
 (a) Transverse colostomy
 ↓ (b) Excision
 ↓ (c) End to-end union over a wide tube
- (7) *Whole colon*
 Ind (a) Severe and intractable colitis
 (b) Hirschsprung
 (c) Polyposis coli
 Tech (1) Complete colectomy
 ↓ (2) End to-end anastomosis
 Between ileum and pelvic colon
 Over rectal tube

(K) EMERGENCY OPERATIONS ON INTESTINES

(1) RUPTURE OR PERFORATION

- Clinic (a) History of etiology
 (b) Shock
 (c) Acute perforative abdomen
- Speci al (d) **Localised tenderness**
- Pre oper (1) Anti shock
 (2) *Keep the suspected part most dependent*
- Anæsth Local, spinal, general
- Operation (1) **Incision** -
 (a) Right paramedian
 or (b) Upper midline
 (2) **Note** :
 ? (a) Escape of gas
 (b) Escape of bile stained fluid
 (c) Escape of fecal fluid
 (3) **Explore** - (Do not allow prolapse)
 (a) Local suspected area
 or (b) General
 (a) Duodeno jejunal flexure
 (β) Jejunum
 (γ) Ileum (near cæcum)
 (δ) Colon
 (4) **Treat the focus**
 (a) **Isolate** By clamps and packs
 ↓ (b) **Close the perforation**
 (a) Purse string small holes
 (β) Transverse suture big holes
 ↓ (c) Reinforce by an omental patch
 or (d) **Excise** - If blood supply endangered

- (5) **Search for other foci**
- (6) Search for other injuries
- (7) Peritoneal toilet
- (8) **Suprapubic drain :**
: (Not necessary in early cases)
- (9) Proximal intestinal drainage :
Ind: (a) Leakable closure
(b) Retro peritoneal wounds

(2) ACUTE INTESTINAL OBSTRUCTION :

- Pre oper : (a) *Stomach or gastro-duodenal suction*
(b) Low turpentine enemata :
: Two enema diagnosis
(c) Anti shock measures :
: *Glucose-saline*, warmth, morphia
(d) Intravenous . iso or hypertonic saline
: glucose
(e) Anti gas gangrene serum

- Anæsthesia : (1) **Spinal**
(2) Local
(3) General :
: *Never forget to pass and keep in stomach tube*

- Steps : (1) **Incision :**
: Right paramedian para-umbilical
(2) **Exploration :**
(a) *Cæcum* .
(a) Distended .
: No exploration
: Do cæcostomy
(β) Collapsed : explore further
(b) Last foot of ileum
(c) Pelvis
(d) Hernial rings
(e) Umbilicus
(f) Intestines :
: Follow .
(a) *Empty coils proximally*
or (β) Distended coils distally
(3) **Treatment :**
(A) *Case very late + condition serious .*
: **Temporary intestinal drainage :**
: Of first available loop
(B) *Cæcum distended :*
: Cæcostomy and closure
(C) *Failure of search :*

- (1) **If no gangrene:**
 - (a) Trocar-decompression
 - or (b) Enterostomy: temporary
 - or (c) Short circuit:
 - : Distended with collapsed
- (2) **If gangrene:**
 - (a) Exteriorisation
 - : With proximal drain
 - or (b) Excision
 - : With both limbs drain
- (D) *Cause found:*
 - (1) **If removable:**
 - (a) Remove the cause
 - or (b) Removal of the cause
 - + Intestinal drainage
 - (2) **If irremovable:**
 - (a) Short circuit
 - or (b) Permanent proximal drain
- (E) *Site of the focus:*
 - (1) **If below the cæcum:**
 - (a) Cæcostomy
 - or (a) Transverse colostomy
 - + (b) *No treatment of primary*
 - (2) **If above the cæcum:**
 - Treat the primary cause*
 - (a) Without intestinal drain
 - or (β) With intestinal drain
- (F) *Stage of the disease:*
 - (1) **No gangrene:**
 - (a) General condition bad.
 - . Intestinal drainage only
 - (b) General condition good.
 - (a) Early cases
 - Remove the cause
 - (β) Late cases
 - Remove the cause
 - + Intestinal drain
 - (2) **Gangrene present:**
 - (a) General condition serious:
 - (a) Exteriorisation
 - + (β) Prox. intest. drain
 - (b) General condition bad:
 - (a) Resection
 - + (β) Drainage of loop ends

- (c) General condition good
 - Resection + anastomosis
 - (α) Without prox drain
 - (β) With proximal drain

- Post treat
- (1) Nothing by mouth + *oral hygiene*
 - (2) *Hydrotherapy* glucose saline
 - (a) Oral
 - (b) Rectal drip
 - (c) Intravenous drip
 - (d) Subcutaneous
 - (3) *Gastro duodenal suction drain*
 - (4) Peristalsis stimulators
 - (A) Rest view
 - Morphine in small doses*
 - (B) Stimulation view
 - (a) Pituitrin $\frac{1}{2}$ c.c. subcutaneously
Not repeated more than twice
 - (b) Prostigmine 1-4000
1 c.c. every 4 hours
 - (c) Eserine
 - (d) *Acetyl choline*
 - (e) Radiant heat to abdomen
 - ↓ (5) Rectal
 - (a) Flatus tube
 - (b) Turpentine enema
 - (c) Ox bile enema
- 15-30 min after stimulator inject

(L) POST OPERATIVE TREATMENT

- (1) Diet Nearer the operation to the anus sooner
may dietary be increased
 - 1st day sips of hot water
 - 2nd day milk two hourly
 - 3rd day bread custard broth
 - 4th day bread butter eggs
 - 5th day fish
 - 10th day full diet
- (2) Bowels
 - (a) Small enema on 4th day
If operation on small intestines
 - (b) No aperient by mouth
For ten days
- (3) Wound
 - (a) Non septic dry dressings
 - (b) Fistulæ
Skin protection with frequent dressings

(M) POST OPERATIVE COMPLICATIONS .**(1) Paralytic ileus :**

- Etio** (a) Continuation of pre operative condition
 (b) Operative trauma and exposure
 (c) Toxæmia
 (d) Stimulation of peristalsis .
 Too early and prolonged

(2) Peritonitis :

- Etio** (a) Continuation of pre operative condition
 (b) Leaving in untreated focus
 (c) Operative soiling of the peritoneum
 (d) Post operative leak through anastomosis

(3) Burst abdomen :

- Etio** (a) Access of digestive juices to the wound
 (b) Faulty sutures
 (c) Straining

(4) Fæcal fistula :

- Etio** (a) Perforation or gangrene
 ↓ (b) Peri intestinal accumulation
 ↓ (c) Bursting
 (a) Through the operative wound
 or (β) Through abscess drainage

(5) Wound infection :

- Diffuse cellulitis of the abdominal wall .
 (a) Non specific
 (b) Gas gangrene

(6) Chest complications :

- (a) *Aspiration pneumonia*
Etio (a) General anæsthesia
 (β) Leaving out pre operative stomach wash
 (b) Collapse of the lung

(7) Septic parotitis**(8) Toxæmia : Intestinal, urinary, metabolic****(9) Sequelæ :**

- (a) Adhesions → intestinal obstruction
 (b) Stricture → " "
 (c) Ventral hernia

IMPORTANT POINTS

- (1) *In a case of imperforate anus, do left inguinal colostomy if aspiration is unsuccessful at a depth of half an inch.*
 (2) **Congenital causes of acute intestinal obstruction :**
 (a) *Imperforate anus*
 (b) Occlusion of the ileum
 (c) Occlusion of the duodenum

- (d) Volvulus neonatorum
- (e) Strangulated umbilical hernia
- (f) *Exomphalos*
- (3) Diseases requiring massive intestinal resections
 - (a) Volvulus of the small intestine with gangrene
 - (b) Mesenteric thrombosis with gangrene
 - (c) Strangulated hernia with gangrene
- (4) Melæna may be the only symptom of ulceration of Meckel's diverticulum especially in children
- (5) Meckel's diverticulum clinical syndrome
 - (a) Catarrhal inflammation pseudo appendicitis
 - (b) Acute intestinal obstruction
 - (c) Peptic ulceration melæna in children
 - (d) Intussusception
- (6) *In every case of 'appendicitis' with no appendicular morbidity, do not forget to look for Meckel's diverticulum*
- (7) *Stab wound of the abdomen*
 - (a) *Explore every case*
 - (b) *Length of the wound is no criterion of the depth*
 - (c) *Probing is worse than useless*
 - (d) *Suture the perforation at right angles to the long axis of the intestine*
- (8) Suture of gunshot injuries of the intestines is preferable to resection
- (9) Clinical forms of diverticulitis
 - (a) Inflammatory
 - (b) Obstructive
 - (c) Carcinomatous
 - (d) Fistulous
 - (α) External
 - (β) Internal
- (10) Perforation and stricture are the common complications of any ulcer of the colon.
- (11) Think of Crohn's regional ileitis in all cases of appendicitis of some duration
- (12) The permanent cure of extensive, intractable, chronic ulcerative colitis demands complete removal of diseased bowel
- (13) Crohn's disease
 - (a) Young adult
 - + (b) Low grade inflammation
 - + (c) Partial intestinal obstruction
- (14) *In tuberculous intestine, remember that strictures are multiple, short circuit should be performed proximal to the highest stricture.*
- (15) Chronic appendicitis syndrome in a young anæmic female especially Mohamedan ? T B cæcum

- (16) In typhoid abdomen
 - (a) Signs of peritonitis may be masked by toxæmia
 - (b) Typhoid tympanitis may mask perforative peritonitis
 - (c) *Sudden shock in typhoid.*
 - (α) ? *Hæmorrhage*
 - (β) ? *Perforation*
- (17) *Think of typhoid in any abdominal emergency from a typhoid area*
- (18) In ambulatory typhoid, hæmorrhage or perforation may be the first sign of the disease
- (19) *Most common causes of intestinal fistula*
 - (a) *Appendicitis post operative*
 - (b) *T B intestines*
 - (c) *Carcinoma*
- (20) Fæcal odour does not mean faecal fistula
- (21) Anomalous syndrome of carcinoma colon
 - (a) Pseudo appendicitis
 - (b) Tuberculous abscess
 - (c) Colitis with spasm
 - (d) Megacolon
 - (e) Gall stone colic
 - (f) Cystitis.
- (22) Only a small minority in whom a polyp can be seen with sigmoidoscope have diffuse polyposis
- (23) 70% of all surgical procedures for colon disease are performed for new growths, the vast majority of which are malignant.
- (24) In patients with increasing constipation, colic and melæna carcinoma colon must be the diagnosis until proved otherwise, even if the sigmoidoscope and the X rays fail to reveal it.
- (25) In carcinoma colon, actual size of the tumour bears an inverse relationship to its malignancy
- (26) *Only definite contra indications for radical removal of carcinoma colon are*
 - (a) Secondaries in liver
 - (b) Ascitis
 - (c) Secondaries in pelvis.
- (27) Growths of the left colon are obstructive, growths of the right colon are rarely obstructive, but lead to early cachexia.
- (28) *Diagnosis of carcinoma colon is best made by a continual remembrance of its possibility in a middle-aged person with any alteration in the bowel habit*

- (29) *In carcinoma colon, cæcum bears the brunt of the obstruction, and so the obstructive or inflammatory signs are most marked in right iliac fossa*
- (30) *Carcinoma colon may occur in quite young people*
- (31) *Cachexia may be absent till the last in carcinoma of the left colon*
- (32) *In excision of the intestines for carcinoma, there are two guiding principles*
 - (a) *Lymph drainage*
 - (b) *Blood supply*
- (33) *Total mortality of acute intestinal obstruction is 40%*
- (34) *In intestinal obstruction the classical picture of any abdominal emergency is the herald of impending death*
- (35) *External strangulated hernia is the most common single cause of acute intestinal obstruction*
- (36) *Five most common causes of acute intestinal obstruction*
 - (a) *Strangulated external hernia*
 - (b) *Volvulus*
 - (c) *Internal strangulation*
 - (d) *Carcinoma*
 - (e) *Adhesions*
- (37) *In carcinoma colon*
 - (A) *A transition upwards is noted from right to left in four features*
 - (a) *Average duration of symptoms*
 - (b) *Constipation and colic*
 - (c) *Diarrhoea*
 - (d) *Macroscopic bleeding*
 - (B) *A transition downwards is noted from right to left in following four features*
 - (a) *Anæmia*
 - (b) *Indigestion*
 - (c) *Localised pain*
 - (d) *Palpable tumour*
- (38) *Strangulation without complete obstruction*
? Richter's hernia
? Strangulated omentum
- (39) *Death within a few hours may follow rapid decompression of distended gut by operation*
- (40) *Chief causes of death in small gut obstruction*
 - (a) *Peritonism*
 - (b) *Dehydration*
 - (c) *Toxæmia*
- (41) *Nervous shock and peritonitis are the chief causes of death in strangulation bacterial toxæmia plays a secondary part*

- (42) Liquid faeces may be passed once after the onset of mechanical obstruction of the small intestine but after that there is absolute constipation.
- (43) Main causes of intestinal obstruction
- (A) Congenital
 - Imperforate anus*
 - (B) Early life
 - (a) Strangulated hernia
 - (b) *Intussusception*
 - (c) Bands
 - (d) Meckel
 - (C) Middle life
 - (a) *Strangulated hernia*
 - (b) *Adhesions and bands*
 - (c) Carcinoma
 - (d) *Volvulus*
 - (D) Late life
 - (a) Carcinoma
 - (b) *Strangulated hernia*
 - (c) Faecal impact on
 - (d) *Volvulus*
 - (e) *Intussusception*
 - (E) Post operative or post peritonitic
 - (a) Paralytic ileus
 - (b) *Adhesions and bands.*
- (44) Intestinal obstruction with abdominal scar
? Post operative adhesions.
- (45) In simple intestinal obstruction, death is due to dehydration
by (a) Vomiting
(b) Loss of fluid in the bowel lumen
- (46) In strangulation death is due to
(a) Nervous shock
(b) Dehydration
(c) *Toxaemia*
- (47) *Early and still earlier operation, after*
(a) *Intravenous saline*
(b) *Spinal anaesthesia*
(c) *Gastro-duodenal suction*
Is the key to success in acute intestinal obstruction
- (48) *Sudden deflation of dilated intestine has been the effective cause of death due to collapse and toxæmia*
- (49) *Fundamental symptoms and signs of acute intestinal obstruction*
- | | |
|---------------------|---------------------------|
| (a) <i>Pain</i> | } <i>Peritonism triad</i> |
| (b) <i>Vomiting</i> | |
| (c) <i>Shock</i> | |

- (d) *Copro stasis*
- (e) *Distension*
- (50) *Gripping pains* not relieved by ordinary measures constitute the outstanding symptom of all mechanical intestinal obstructions.
- (51) *Persistent regurgitant vomiting* is one of the most constant symptoms of intestinal obstruction
 - (a) Early and marked in small gut
 - (b) Late and insignificant in large gut
- (52) *Persistent vomiting* in acute intestinal obstruction may be absent in
 - (a) Starvation post operative ileus
 - (b) Low large gut obstruction
 - (c) Partial obstruction Richter
- (53) History of *arrest of flatus* is of real importance in acute intestinal obstruction
- (54) '*Two diagnostic enemata*' are valuable in the diagnosis of intestinal obstruction
No faeces or flatus with the second enema
- (55) *Visible peristalsis* accompanied by colicky pain is pathognomonic of acute or chronic obstruction
- (56) *Distended and gurgling caecum* is a prominent sign in large gut obstructions
- (57) Never omit *rectal or vaginal examination* in every case of intestinal obstruction
- (58) *Abdominal tenderness and rigidity are absent in acute intestinal obstruction, unless peritonitis supervenes*
- (59) Never omit *abdominal auscultation* in every case of intestinal obstruction
 - (a) Mechanical obstruction borborygmi
 - (b) Paralytic ileus dead silence
- (60) Ephedrine is best avoided in intestinal obstruction.
- (61) Certain cases of small gut obstruction without strangulation can be saved without operation by duodenal tube siphonage.
- (62) Gastro duodenal suction decompression does not avail beyond ileo caecal valve
- (63) *In the treatment of acute intestinal obstruction, gradual decompression is the key note of success*
 - (a) *Small gut obstruction*
Indwelling duodenal tube suction
 - (b) *Large gut obstruction*
Wangensteen transverse colostomy
- (64) *Best means of releasing the distension and consequent stagnation of circulation in the bowel wall are*

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 - (d) *Volvulus*
 - (D) Late life
 - (a) *Carcinoma*
 - (b) *Strangulated hernia*
 - (c) *Faecal impact on*
 - (d) *Volvulus*
 - (e) *Intussusception*
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(b) Vomiting		
(c) Shock		

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 - (a) Early and marked in small gut
 - (b) Late and insignificant in large gut.
- (52) Persistent vomiting in acute intestinal obstruction may be absent in
 - (a) Starvation post operative ileus
 - (b) Low large gut obstruction
 - (c) Partial obstruction Richter
- (53) History of *arrest of flatus* is of real importance in acute intestinal obstruction
- (54) 'Two diagnostic enemata' are valuable in the diagnosis of intestinal obstruction
No faeces or flatus with the second enema
- (55) *Visible peristalsis* accompanied by colicky pain is pathognomonic of acute or chronic obstruction.
- (56) *Distended and gurgling caecum* is a prominent sign in large gut obstructions
- (57) Never omit *rectal or vaginal examination* in every case of intestinal obstruction.
- (58) *Abdominal tenderness and rigidity are absent in acute intestinal obstruction, unless peritonitis supervenes*
- (59) Never omit *abdominal auscultation* in every case of intestinal obstruction
 - (a) Mechanical obstruction borborygm
 - (b) Paralytic ileus dead silence
- (60) Ephedrine is best avoided in intestinal obstruction
- (61) Certain cases of small gut obstruction without strangulation can be saved without operation by duodenal tube siphonage.
- (62) Gastro duodenal suction decompression does not avail beyond ileo caecal valve
- (63) *In the treatment of acute intestinal obstruction, gradual decompression is the key note of success*
 - (a) *Small gut obstruction*
Indwelling duodenal tube suction
 - (b) *Large gut obstruction*
Wangensteen tranverse colostomy
- (64) *Best means of releasing the distension and consequent stagnation of circulation in the bowel wall are*

- (a) Duodenal tube suction-decompression
- (b) Intravenous hypertonic saline
- (c) Liberal use of morphia
- (65) A good test for restoration of chlorides in acute vomiting is to add a drop of silver nitrate to urine which gives white precipitate.
- (66) Simple glucose stimulates urinary salt excretions and so should not be given, unless combined with saline, in acute intestinal obstruction
- (67) 70% of ileal obstructions are associated with strangulation
- (68) Hypertonic intravenous saline stimulates peristalsis and is therefore contra indicated in unrelieved mechanical obstructions unless there is proximal enterostomy
- (69) 95% of internal strangulations affect the small intestines, the lower part of the ileum being the common site
- (70) Palliative treatment is indicated for
 - (a) High small gut obstruction
 - (b) Large gut obstruction
- (71) Immediate surgery is indicated for
 - (a) Low small gut obstruction
 - (b) Strangulation
- (72) In acute intestinal obstruction, whatever the treatment, there must be proximal external drainage
- (73) Traumatic shock and peritonitis are the chief accompaniments of strangulation and early diagnosis with timely operative interference is the only treatment
- (74) In acute abdomen operations
 - (a) Get in quick and get out quicker
 - (b) Do the minimum consistent with ultimate recovery
- (75)
 - (c) Pre operative } any intestinal obstruction
 - (d) Post operative }
- (2) Enterostomy.
 - Ind (a) Low small gut obstruction
 - (b) No strangulation left in
 - (c) Cause (α) Dealt with (additional)
 - (β) Left alone (palliative)
 - (preliminary)
- (3) Caecostomy or transverse colostomy
 - Ind Large gut obstruction
- (76) After treatment of intestinal obstruction operations
 - (a) Gastro-duodenal suction tube
 - (b) Intravenous glucose saline

- (c) Pre operative } any intestinal obstruction
(d) Post operative }

- (2) *Enterostomus*.

- Ind (a) Low small gut obstruction
(b) No strangulation left in
(c) Cause (α) Dealt with (additional)
(β) Left alone (palliative)
(preliminary)

- (3) *Cæcostomy or transverse colostomy*

- Ind Large gut obstruction

- (76) After treatment of intestinal obstruction operations
(a) Gastro-duodenal suction tube
(b) Intravenous glucose saline

(c) *Peristalsis promoters :*

- (a) *Morphia*
- (β) *Acetyl choline*
- (γ) *Ox bile enema*
- (δ) *Hypertonic saline.*

(77) Intermittent colicky pain with interval pallor in healthy male infants :

? Intussusception

(78) Intussusception in adolescent life denotes inverted Meckel's diverticulum, that in old life denotes carcinoma, in infants it is idiopathic.

(79) Copious bright red hæmorrhage with no mucus and no lump in abdomen or on rectal examination :

: Suspect typhoid more than intussusception

(80) Intussusception of infants is not primarily an obstruction ; the early picture is one of recurrent colic and mesenteric shock.

(81) Intussusception of adults behaves like ordinary intestinal obstruction.

(82) The treatment of acute intussusception is early and speedy operation

(83) Methods of reduction of intussusception :

(A) *Conservative :*

- (a) Hydrostatic
- (b) Barium

} : enema

(B) *Operative :*

- (a) Manual milking
- (b) Cope's finger method
- (c) Daw's forceps method
- (d) Brown's incision method.

(84) Prognosis in intussusception varies inversely with the time that the infant is on the operation table under general anæsthesia. With spinal, it does not matter much.

(85) In intussusception, any of the devices to shorten the mesentery or anchor the cæcum are useless unless recurrence occurs

(86) In children, leave out many tailed abdominal bandage after laparotomies ; elastoplast dressings are all that is required.

(87) Differential diagnosis between prolapse rectum and intussusception :

- (a) Rectal prolapse .
: Continuous with anal skin
- (b) Intussusception :
: Sulcus between the protrusion and anal margin.

- (88) Chocolate coloured fluid in the peritoneum
 ? Strangulation
 ? Malignancy
- (89) Ballooning of the rectum is a sign of low colon obstruction
- (90) *Never allow prolapse of distended intestines outside the abdomen, as it leads to fatal collapse*
- (91) Drain the abdomen in all cases of volvulus.
- (92) Special signs of sigmoid volvulus
 (a) Tenesmus
 (b) Distension + +
 (c) Inability to pass an enema or rectal tube
 (d) Ballooned rectum
- (93) *Every case of acute small gut obstruction in a robust adult, think of volvulus*
- (94)
- (95) All raw areas in abdomen must be covered by peritoneum, to avoid adhesions.
- (96) Intraperitoneal strangulation reveals itself by
 (a) Blood stained peritoneal exudation
 (b) Blue black colour
- (97) Special diseases of the ileum
 (a) Congenital (α) Meckel
 (β) Atresia
 (b) Inflammations (α) Typhoid
 (β) Tuberculosis
 (γ) Regional ileitis
 (c) Intussusception
 (d) Volvulus
 (e) Impactions FB or gall stone
 (f) Adhesions appendix, salpinx
- (98) Signs of obstruction due to stricture appear earlier in large than in small gut, due to solid nature of contents
- (99) Special features of strangulation
 (a) Sudden onset and extremely acute course
 (b) Severe pain + shock
 (c) Early toxæmia
 (d) Tenderness + rigidity
 (e) Blood in peritoneum + per anum
- (100) Bloody discharge in peritoneum
 (a) Carcinoma
 (b) Strangulation bands, volvulus, intussusception, hernia, mesenteric thrombosis
 (c) Acute pancreatitis

- (d) Intraperitoneal hæmorrhage
- (e) Streptococcal peritonitis
- (101) Mesenteric embolism
 - Sudden very acute intestinal obstruction with internal hæmorrhage
 - (a) Blood in peritoneum
 - (b) Blood per anum
 - (c) Hæmatemesis.
- (102) Remove the mesentery along with the gangrenous gut in mesenteric embolism
- (103) *Beware of cases which feel 'too well' after acute laparotomies, delayed shock may lead to sudden unexpected collapse or patient may be too toxic*
- (104) *Intestinal decompression as far as ileo cæcal junction can be nicely done by introducing gastro duodenal tube with suction drainage*
- (105) Cause of gangrene of the gut is cutting off of the blood supply due to
 - (a) Strangulation
 - (b) Trauma to or ligature of the blood vessel
 - (c) Mesenteric thrombosis
- (106) If liquid paraffin injected by a catheter into an intestinal fistula, does not appear per rectum, diagnose distal obstruction
- (107) Most important factors in abnormal anus
 - (a) Spur
 - (b) Distal obstruction
 - (c) Persistent infection
 - (d) Malignancy
- (108) *Do not take McBurney incision for appendicectomy in children, as the appendix may lie high up*
- (109) Lesser curve below the level of umbilicus
Entero ptosis
- (110) *In foreign bodies*
 - (a) *Never give a purge*
 - (b) *Examine every stool passed*
 - (c) *Follow with X Ray screen daily*
- (111) Think of diverticulitis in elderly people with left iliac trouble.
- (112) *Think of typhoid in every emergency abdomen*
- (113) Carcinoma colon
 - (a) Sometimes occurs in young people
 - (b) Common sites rectum, sigmoid, cæcum
 - (c) Signs in right iliac fossa
 - (d) Cachexia may be absent till late.

- (114) *Acute intestinal obstruction*
 (A) { ? Mechanical (a) Primary
 { ? Paralytic (β) Secondary
 (B) { ? High small gut
 { ? Low small gut
 { ? Large gut
 (a) *Never forget to aspirate the stomach before operation*
 (b) *Spinal anaesthesia is best*
 (c) *Cæcum is the first and most important landmark in exploration*
- (115) Think of intussusception in every case of 'dysentery'
- (116) *Acute intestinal obstruction (small gut) in adults*
 ? Volvulus ileum
- (117) *Acute intestinal obstruction (large gut) in seniles*
 ? Volvulus sigmoid
 ? Carcinoma colon
- (118) *Extreme distension is pathognomonic of*
 (a) Sigmoid volvulus
 (b) Paralytic ileus.
- (119) *Never forget ileus terminosus in children, think of worms in every acute or chronic abdomen in children, never operate on a chronic abdomen in children, without giving two preliminary doses of santonin and excluding worms*
- (120) *Intestinal obstruction in old*
 (A) Acute
 Volvulus
 (B) Acute on-chronic
 (a) Carcinoma
 (b) Diverticulitis
 (c) Faecal impaction
- (121) *Rigid and long kept rubber drain*
 (a) Paralytic ileus
 (b) Faecal fistula
 (c) Secondary hæmorrhage
 (d) Ventral hernia
- (122) *The most important single symptom in acute intestinal obstruction is inability to pass flatus*
- (123) *Treatment of paralytic ileus should not be curative but must be preventive by*
 (a) Minimising operative trauma
 (b) Early treatment of peritoneal infection.
- (124) *Causes of post-operative obstruction*
 (a) Anal spasm meteorism

- (b) *Paralytic ileus* :
 - (a) Nervous
 - (β) Mechanical : muscular exhaustion
 - (γ) Toxic : peritonitis
- (c) *Mechanical* : torsions, adhesions, strictures.
- (125) For the common post operative meteorism without a true ileus, spasm of the anal sphincter is responsible and so, *anal stretching must be a routine after every laparotomy.*
- (126) Dead silence on auscultation over abdomen :
? Paralytic ileus
- (127) Violent borborygmi on auscultation over abdomen :
: Mechanical obstruction.
- (128) *Drastic catharsis, anal spasm and prolonged peritoneal drainage tube are very common causes of post operative paralytic ileus, and can be easily avoided.*
- (129) Unavoidable causes of post operative paralytic ileus are :
 - (a) Peritonitis
 - (b) Operative trauma
 - (c) Mental shock.
- (130) *Spinal anæsthesia is best in abdominal surgery* :
 - (a) Muscular relaxation
 - (b) Peristalsis stimulation
- (131) Post operative obstruction appearing within first three days is paralytic, after the fourth day, it is mechanical.
- (132) Pituitrin and eserine produce only local spasms in small intestines and produce after-relaxation Pituitrin is of value only in colonic stasis
- (133) *Without saline or insulin, glucose has depressing effect on intestinal peristalsis*
- (134) If during injection of hypertonic saline, colicky pains occur without passage of flatus or fæces, diagnose mechanical obstruction
- (135) *Spinal anæsthesia for paralytic ileus, should never be postponed beyond the end of second day and should invariably follow hypertonic saline and enemata in sequence.*
- (136) *Ephedrine must never be given after spinal anæsthesia, as it nullifies the effect of the spinal on peristalsis; intravenous saline may be given instead.*
- (137) *In obscure cases of paralytic ileus, remember* :
 - (a) Uræmia
 - (b) Typhoid
 - (c) Spinal disease
- (138) Summary of treatment for post operative obstruction :
 - (A) *First 24 hours* :

- (2) Intravenous glucose saline
- (3) Gastro duodenal suction drainage :
 - (a) Nasal route
 - (b) Oral route
- (4) Anal stretching or flatus tube
- (5) Morphia : 1/6 gr. 6 hourly
- (B) *At the end of first 24 hours :*
 - (1) Ox-bile enema : 6 ounces
 - ↓ (2) Turpentine enema
- (C) *24 hours to 36 hours :*
 - (1) Intravenous saline
 - (2) Gastro duodenal suction
 - (3) Heat to abdomen
 - (4) Morphia . 1/6 gr 6 hourly
- (D) *36 hours to 48 hours :*
 - (1) (a) Hypertonic intravenous saline :
: 500 c.cs. , 10%
↓ (b) Ox-bile enema
↓ (c) Turpentine enema
 - (2) Acetyl choline : '1 gm. hourly for 6 doses
- (E) *End of 48 hours :*
 - (1) Spinal anæsthesia
 - ↓ (2) Operative measures
 - (a) Cæcostomy
 - (b) Enterostomy
 - (c) Short circuit :
. Jejunotransversostomy.
- (139) Paul's tube is better than a catheter in cæcostomy.
- (140) Chief indications for colostomy :
 - (a) Carcinoma
 - (b) Ulceration
 - (c) Fibrosis
 - (d) Fistulæ
 - (e) Volvulus
 - (f) Obstructions
 - (g) Anastomosis.
- (141) If colon cannot be found on exploration, inject water per anum.
- (142) Immediate opening of a colostomy is better than delayed ; it is safe and spares pain and agony to the patient.
- (143) Important rules for intestinal anastomosis :
 - (a) No intestinal anastomosis must be done in the presence of established obstruction
 - (b) *Never anastomose the intestine which cannot be exteriorised*

- (c) Never allow the suture line to be flooded with intestinal contents
- (d) Never allow peritoneal soiling
- (e) Never do anastomosis of a portion whose mesentery is not healthy
- (f) *Take extreme care to see that suture line is not devascularised*
- (g) No tension on suture line
- (h) When in doubt, *do proximal intestinal drainage*
- (144) When gangrene of the intestine is limited and annular, it is safer to invaginate than resect
- (145) Indications for intestinal exclusion or short circuit
 - (a) Intestinal obstructions growth or fibrosis
 - (b) Fæcal fistulæ
 - (c) Colonic stasis
- (146) In operations for fæcal fistula
 - (a) Simple short circuit is useless
 - (b) Unilateral complete exclusion is ineffective
 - (c) Bilateral complete exclusion is necessary
- (147) In choosing a site for anastomosis to restore continuity, avoid long blind ends, as they are undrained cul de sacs and may lead to
 - (a) Stasis
 - (b) Distension and perforation
Of the proximal blind end
Due to vis a tergo
- (148) *Colon carcinoma* (virulence)
 - (a) *Colloid is most malignant*
 - (b) Ring stricture is midway
 - (c) *Fungating is least malignant*
- (149) Frequent sites of carcinoma colon
 - (a) Pelvic and iliac 48%
 - (b) Cæcum 15%
 - (c) Splenic flexure 10%
 - (d) Transverse and ascending 9%
 - (e) Descending 6%
- (150) Types of growth in carcinoma colon
 - (a) Tubular stricture
 - (b) Infiltrating ulcer
 - (c) Ring stricture
 - (d) Papillomatous.
- (151) In every case of colectomy and anastomosis proximal drainage either as a preliminary or as an additional measure, is invaluable as a safety valve.
- (152) In cases of obstruction, it is unjustifiable to attempt a radical cure in one stage, first step is to relieve the obstruction

- (153) *Additional caecostomy is a great safeguard in all colon anastomosis, so also drainage from near about the suture line*
- (154) Essentials for successful colon anastomosis :
- Adequate exposure
 - Thorough mobilisation
 - Adequate blood supply
 - No tension
 - Protection to suture line with drainage upto it
 - Proximal bowel drainage or rectal tube.
- (155) *The usual cause of disaster after colectomy with anastomosis is leakage at the suture line in the following few days due to a patch of gangrene. It is of utmost importance to be sure of the blood supply of the colon ends*
- (156) Paul's colectomy
- Mobilisation
 - ↓ Exteriorisation of the loop
 - ↓ (c) Basal lateral union of limbs of the loop :
With or without apex drain
 - ↓ (d) Excision
 - Immediate
 - Delayed
 - ↓ (e) Enterotome application to the spur
 - ↓ (f) Closure of the fistula
- (157) Drawbacks of Paul-Mikulicz
- Not suitable for immobile parts
 - Partial removal of lymph area
- (158) Best methods of colon resection and anastomosis .
- Multi staged operation
 - Proximal drainage
 - ↓ (b) Resection → anastomosis
 - ↓ (c) Closure of the proximal drain
 - or (B) Extra peritoneal anastomosis of Paul Mikulicz
 - + (C) Proximal intestinal drainage or rectal tube.
- (159) *Methods of combating toxæmia in intestinal obstruction **
- Saline infusions
 - Gastro-duodenal suction drain
 - Anti gas gangrene serum
 - Bile vomit returned per rectum
- (160) *Transverse colostomy as an artificial anus is second to none for comfort and control, and is equally good in cases of large gut obstructions as is caecostomy. It is superior to the latter in that it may serve both purposes* temporary and permanent. The contents are more solid than those of caecum while more fluid than those of sigmoid*
- (161) Blind left inguinal colostomy without exploration is indicated in *

- (a) Carcinoma of pelvic colon
 - (b) Acute or chronic obstruction due to Inoperable carcinoma rectum
 - (c) Imperforate anus with negative aspiration
- (162) Before putting in a Paul's tube in colostomies, isolate the loop by 'hole in the vaseline pad' method Tape is most useful for keeping a Paul's tube firmly in position
- (163) Always protect a laparotomy wound from colostomy by 'adhesive plaster watershed'
- (164) Rectal causes of acute intestinal obstruction
- (a) *Carcinoma*
 - (b) Simple stricture
 - (c) Foreign body
 - (d) Impaction of faeces
 - (e) *Imperforate anus*
- (165) A dessert spoon is very useful in the removal of foreign body or impacted faeces from rectum
- (166) '*Dangerous*' area leakage area
The little triangle at the junction of the gut and its mesentery
- (167) In closing a gap in the mesentery, do not use a needle, tie ligatures over haemostats on each margin
- (168) Intestinal obstruction due to appendix
- (1) Primary appendix acting as a band
 - (2) Secondary post operative
 - (A) *Within first 3 days*
Cause Paralytic ileus
 - (B) *Between 6-10 days*
Cause Bands and adhesions
Clinic Colic + Vomit
Treat Re-exploration
 - (C) *Between 10-21 days*
Cause Pelvic peritonitis
Treat Ileo transversostomy
 - (D) *After 90 days*
Cause Adhesions bands ventral hernia
Treat Re exploration
↓ Removal of the cause
or Short circuit
 - (E) *Post-operative any period*
Cause Functional
Clinic Constipation
Treat Laxatives

- (169) Acute intestinal obstruction + mitral stenosis or endocarditis = mesenteric embolism → operate immediately
- (170) Valvular caecostomy as the last stage in an operation for carcinoma colon, is now routine and an important factor in decreasing the post operative risks.
- (171) *First worry of the surgeon after laparotomy for acute obstructive lesions is paralytic ileus, the second worry is peritonitis*
- (172) The first inquiry at the time of first post operative visit to the patient will be about his bowel action, if a laparotomy has been done
- ? Has he passed feces
 - ? Has he passed flatus
 - ? Does he feel any intestinal movements
 - ? Is there any distension
 - ? Is there any vomiting
- (173) *The great question after an urgent laparotomy .
Is the patient heading towards paralytic ileus? If he is, remember that prophylaxis is better than cure, earlier the combating measures are started the better for every body concerned*
- (174) In a case of Meckel's diverticulectomy, use unabsorbable sutures for serous coat, as sometimes ferments may digest catgut sutures, or best is to resect the parent iliac segment
- (175) Treatment of skin excoriation in faecal fistula
- (a) Kiolin paste kiolin + glycerin
 - (b) Suction
 - (c) Protein two catheters
 - (α) Hydrochloric acid into intestine
 - (β) Peptone or beef broth on the skin
 - (d) Yeast
-

CHAPTER VI

THE APPENDIX

(I) APPENDICITIS:

Incidence: (a) **Age:** (α) Rising from birth to 15
 (β) *Maximum from 15 to 30*
 (γ) Declining from 30 to 45
 (δ) Uncommon after 45

(b) **Sex:** Males > females

(c) **Race:** Europeans > Asiatics

(d) **Heredity** and familial

(e) **Diet:** (α) Non vegetarian
 (β) Fat and fatty acids
 (γ) Cellulose deficiency

(f) **Constipation** and purgation

Predisp: **Anatomical peculiarities:**

(a) **Shape:** Closed, kinked, strictured cul de sac

(b) **Contents:** Fæcoliths, worms

(c) **Structure:** Lymphoid

(d) **Blood supply:** Short appendicular art

(e) **Function:** Stasis

Path: (A) *Acute appendicitis*

(1) *Appendicitis proper.*

(a) **Inflammatory:**

Morb. anat. (α) Catarrh
 ↓ (β) Suppuration
 ↓ (γ) Ulceration
 ↓ (δ) Perforation

(b) **Obstructive:**

Causes: (α) Stricture
 or (β) Fæcolith
 or (γ) Kink

Morb. anat: (1) Mucocoele
 ↓ (2) Empyema
 ↓ (3) Perforation
 or (4) Ileus

(c) **Circulatory:**

Morb. anat: (α) Thrombosis of appendicular art.
 ↓ (β) Gangrene

(2) *Appendicular peritonitis:*

Causes: (a) Transmigration of bacilli

- (b) Perforation : at the
 - (a) Tip
 - (β) Hiatus muscularis
- Varieties : (a) **Right iliac peritonitis :**
 - ↓ Right iliac peritoneal abscess
 - Pus surrounded by a wall composed of intestines, *omentum*, adhesions
- (b) **Pelvic peritonitis :**
 - ↓ Pelvic abscess
- Causes : (a) Primary pelvic appendix
 - (β) Secondary
 - : To right iliac abscess
- ↓ (c) **Spreading general peritonitis :**
 - Causes : (a) Primary ileal appendix
 - (β) Secondary
 - ↓ (1) Right iliac abscess
 - ↓ (2) Pelvic abscess
 - ↓ (3) Left iliac abscess
 - ↓ (4) General peritonitis
- (d) **Retro-peritonitis :**
 - ↓ Retro peritoneal abscess
 - Cause Retro cæcal appendix
- (3) *Appendicular intestinal obstruction* :
 - (a) **Primary :** Appendix acting as a band
 - (b) **Secondary :** Due to
 - (a) Inflammatory adhesions
 - (β) Paralytic ileus
- (B) *Chronic appendicitis*
 - (1) **Hyperplastic lymphoid :**
 - Clinic Appendicular dyspepsia
 - (2) **Fibrous :**
 - Causes (a) Adhesions
 - (b) Strictures
 - (c) Kinks
 - Clinic (a) Shrivelled harmless appendix
 - (β) Chronic obstructive appendix
 - (3) **Hyperplasia + fibrosis :**
 - Clinic . Appendicular mass
- (C) *Secondary appendicitis* .
 - (1) As a part of general peritonitis
 - (2) Implication in the inflammation of neighbouring viscera . (a) Salpinx
 - (β) Cæcum

Bacteriology : (a) *B. coli*
 (b) *Streptococcus faecalis*

- (c) B. Welchii
- (d) Aschoff's organism

Clinic: (1) *Acute appendicitis proper*:

Path. varieties: (A) *Inflammatory appendicitis*.

(a) **Peri umbilical or epigastric pain**:

- : Sudden and acute, colicky
- : Accompanied by .

(α) Nausea and vomiting

(β) Peritoneal shock

↓ (b) **Right iliac visceral signs**:

- (1) Pain right iliac
- (2) Hyperæsthesia Sherren's triangle
- (3) **Tenderness: McBurney**

↓ (c) **Rising temperature and pulse**

(d) **P.R.**: Tenderness on right side

(B) *Obstructive appendicitis*

Varieties: (a) Obstruction in appendix

(b) Appendix as an obstruction

Clinic: (a) **Peri-umbilical or epigastric pain**:

- : Acute, sudden, colicky
- : Accompanied by

(α) Nausea and vomiting

(β) **Peritoneal shock**

↓ (b) **Low small gut obstruc. syndrome**:

- (a) Early and repeated vomits
- (b) Colicky attacks
- (c) Absolute constipation
- (d) Paralytic ileus → distension

Special: (1) No rigidity

(2) No temperature

(3) Hyperæsthesia in Sherren's triangle

(4) Rovsing

(C) *Gangrenous appendicitis*

Etio: (a) Thrombosis

(b) Obstruction

Clinic: (1) **Fulminating course**

(2) **Early loss of pain and rigidity**

(3) **Peritoneal toxæmia**:

: Early and pronounced

(4) La Roque testis retraction

(5) Cardio vascular primary lesion

(D) *Appendicular perforation*

Etio: (a) Gangrene

(b) **Tension**

(c) **Ulceration**

- Sites (1) **Tip**
 (2) **Hiatus muscularis**
 (3) **Over a faecolith**

Clinic: Acute inflam or obstruct appendicitis

↓ (a) **Sudden disappearance of:**

- (α) Pain
 (β) Hyperæsthesia
 (γ) Tenderness

+ (b) **Peritonism:** Peritoneal shock

- (α) Vomit
 (β) Falling temperature
 (γ) Rising pulse

↓ (c) **Local peritonitis syndrome**

↓ (d) **Regional peritonitis syndrome**

↓ (e) **General peritonitis syndrome**

Anatomical variations.

(1) *Retrocaecal*

(a) Local signs in right lumbar region

(b) **Pseudo-urinary signs:**

- (α) Ureteral-colic pain
 (β) Hæmaturia

(c) Baldwin's test *Painful leg-lift*

(d) Altschuler test (Med Ann. 1939)
 Tender & spastic rt. pelvic margin

(e) P.R. negative

(2) *Pre ileal*

(a) Medial local signs

(b) Early spreading peritonitis

(c) Early and pronounced ileus

(3) *Promonteric*

(a) **Psoas irritation:**

. Hip flexion & psoas test

(b) Ureteral irritation

. Pseudo ureteral colic

(c) P.R. right sided tenderness

(4) *Pelvic.*

(a) **Irritation of pelvic organs:**

(α) Bladder

(β) Rectum

(γ) Genitals

(b) Obturator internus test

(c) P.R. tenderness

(α) Right sided

(β) Bimanual palpation

(d) **Absence of abdominal rigidity**

(e) **Suprapubic pain**

- (5) *Mid inguinal* :
- | | |
|--------------------|---------------------------------------|
| (a) Tenderness | } above the middle
of Poupart lig. |
| (b) Worm like feel | |
- (6) *Sub hepatic* .
- | |
|--|
| (a) Children |
| (b) Local signs in right hypochondrium |
- (2) *Acute appendicular peritonitis* :
- (A) *Right iliac peritonitis* (Subcæcal appendix)
- | | |
|-----|-----------------------|
| (a) | Pain |
| (b) | Hyperæsthesia |
| (c) | Tenderness |
| (d) | Immobility |
| (e) | Rigidity |
| (f) | Loss of muscle reflex |
| (g) | Mass |
- ↓ *Right iliac abscess*
- | | |
|-----|--------------------------------|
| (a) | History over ten days |
| (b) | Softening → fluctuating lump |
| (c) | Inflammatory œdema of the skin |
| (d) | General septic toxæmia |
| (e) | Leucocytosis > 20000 |
- (B) *Pelvic peritonitis*
(Promonteric or pelvic appendix)
- | | |
|-----|-----------------------------------|
| (a) | Pelvic organs irritation syndrome |
| (b) | P.R. |
- ↓ *Pelvic abscess*
- | | |
|-----|--|
| (a) | History of appendicitis over ten days |
| (b) | Diarrhoea and proctitis:
With mucus per anum |
| (c) | P R. soft cystic swelling |
| (d) | General septic toxæmia |
| (e) | Leucocytosis > 20000 |
| (f) | No abdominal rigidity |
- (C) *Sub-hepatic peritonitis*
(Sub hepatic appendix)
- | | |
|-----|--|
| (a) | Children or ascending paracolic appendix |
| (b) | Pseudo-cholecystitis |
- ↓ *Sub hepatic abscess* :
- | | |
|-----|-----------------------------------|
| (a) | Pseudo cholecystitis or hepatitis |
| (b) | General septic toxæmia |
| (c) | History over ten days |
| (d) | Leucocytosis > 20000 |
- (D) *Spreading general peritonitis* .
: (Pre ileal appendix)
: All symptoms and signs of :

(a) Right iliac peritonitis :
• (Signs more marked)

↓ (b) General peritonitis

(E) *Retro peritonitis*. (Retro-cæcal appendix)

(a) Symptoms and signs of perinephritis

(b) Local signs in the right lumbar region

↓ *Retro peritoneal abscess*.

Sites (a) Right lumbar abscess

(b) Perinephric abscess

Clinic (1) History more than 10 days

(2) Local lumbar mass

(3) Inflammatory oedema

(4) General septic toxæmia

(5) Leucocytosis > 20000

Course of acute attack

(1) Fulminating :

Cause Gangrenous appendicitis

Clinic Toxæmic death in 24 hours

(2) Very acute :

Causes (a) Perforation

(b) Intestinal obstruction

(c) Rapidly spreading peritonitis

Clinic Rapidly spreading clinical syndrome

(3) Acute :

Cause Acute catarrh

Clinic Classical syndrome

(4) Subacute :

Cause Subacute catarrh or obstruction

Clinic Subacute signs

(5) Relapsing :

Clinic Exacerbation in a settling-down attack

(6) Recurrent :

Causes (a) Recurrent catarrh

(b) Recurrent obstruction

Clinic History of multiple acute or subacute attacks with intervals of freedom

(3) *Chronic appendicitis*

(a) Obstructive

: Recurrent appendicular colic

(b) Hyperplastic

: Chronic appendicular mass

(c) Degenerative

: Appendicular dyspepsia

Diff diag (A) *According to the virulence of the course :*

(1) Fulminating: (a) Acute fevers

(b) Acute toxæmias

- (2) **Acute :** (a) **Acute abdominal lesions :**
 (1) Gastro duodenal
 (2) Biliary
 (3) Pancreatic
 (4) Intestinal
 (5) Pelvic
 (b) **Acute colics :**
 (1) Intestinal
 (2) Urinary
 (3) Uteral
 (4) Biliary
- (3) **Subacute :** (a) Regional inflammations
 (b) Pelvic inflammations
- (4) **Chronic :** (a) **Colics**
 (b) **Dyspepsias :**
 (a) Organic
 (β) Functional
 (c) **Causes of a local mass :**
 (a) *Tuberculosis*
 (β) *Syphilis*
 (γ) *Carcinoma*
 (δ) *Lymphadenitis*
 (d) **Chronic colitis**

(B) *According to anatomical structure lesions*

- { (1) **Thoracic :** Referred
 (2) **Spinal :** Referred
 (3) **Nervous system :** tabetic crises
 (4) **Genito-urinary :**
 (a) Retro cæcal appendix
 (b) Pelvic appendix
 (5) **Pelvic :** Pelvic appendix
 (6) **Intestinal :** Perforations
 (a) Pre ileal appendix
 (b) Appendicular band
 (7) **Gastro duodenal :**
 : Migrated gastro duodenal contents
 (8) **Biliary :** sub hepatic appendix
 (9) **Hip joint :** psoas appendix

Differential diagnosis in a case of acute appendicitis

(1) *Conditions not requiring operation*

- (A) **Referred causes :**
 (a) **Basal pleurisy**
 (b) **Spinal caries**
 (c) **Tabetic crises**
- (B) **Colics :**
 (a) **Reno ureteral**
 (b) **Intestinal**

- (c) Uteral
- (d) Biliary
- (C) **Medical causes :**
 - (a) *Pyelitis*
 - (b) *Colitis*
 - (c) *Typhoid*
 - (d) *Uræmia*
 - (e) *Intestinal influenza*
 - (f) *Muscular rheumatism*
- (2) *Conditions requiring operations*
 - (A) *Extra peritoneal .*
 - (a) *Reno ureteral stones*
 - (b) *Psoas affection : Abscess*
 - (c) *Iliac lymphadenic abscess*
 - (d) *Iliac osteomyelitis*
 - (e) *Acute torsion of the testis*
 - (B) *Intra peritoneal*
 - (a) **Local : Acute ileo-cæcal affections**
 - (1) *Volvulus*
 - (2) *Intussusception*
 - (3) *Typhoid perforation*
 - (4) *Meckel's diverticulitis*
 - (5) *Regional ileitis*
 - (6) **Cæcal obstruction :**
 - (a) *Tuberculous . acute on chronic*
 - (b) *Carcinoma acute on chronic*
 - (c) *Volvulus acute*
 - (d) *Intussusception*
 - (7) *Ileo-cæcal lymphadenitis*
 - (b) **Pelvic : Genito-urinary affections**
 - (1) *Acute salpingitis : Pyosalpinx*
 - (2) *Ectopic gestation*
 - (3) *Early pregnancy*
 - (4) *Twisted ovarian cyst*
 - (5) *Ruptured lutein cyst*
 - (c) **General peritoneal :**
 - (1) *Duodenal perforation*
 - (2) *Acute cholecystitis*
 - (3) *Intestinal obstruction*
 - (4) *Torsion omentum*

Differential diagnosis : Sex factor

- (1) **Females .**
 - (a) *T B æcum*
 - (b) *Pyelitis*
 - (c) *Salpingitis*
 - (d) *Cholecystitis*
- (2) **Males : Torsion of the right testis**

Differential diagnosis : Age factor

(1) Children :

- (a) **Pleurisy or pneumonia**
- (b) **Tabes mesenterica**
- (c) **Iliac lymphadenitis**
- (d) **Pyelitis**
- (e) **Cholecystitis . (high appendix)**
- (f) **Intussusception**
- (g) **Worms**

(2) Old :

- (a) **Diverticulitis**
- (b) **Carcinomatous obstruction**
- (c) **Fæcal impaction**

Complications : Of acute appendicitis

. (See post operative compl too)

(1) **Peritonitis :**Sites : (a) **Local**(b) **Spreading**(c) **Residual : pelvic, sub-diaphragmatic**Varieties : (a) **Plastic \rightarrow fibrosis \rightarrow adhesions**(b) **Suppurative \rightarrow abscesses**(c) **Fulminating \rightarrow peritoneal toxæmia**(2) **Intestinal obstruction :**Varieties . (A) **Mechanical :**(a) **Primary . appendicular band**(b) **Secondary : band due to appendicitis**(B) **Paralytic**(3) **Fæcal fistula : External or internal**(a) **Pathological : (a) Inflammation** \downarrow (b) **Abscess formation** \downarrow (c) **Bursting**(b) **Post-operative : (a) Traumatic**(b) **Pressure necrosis**(c) **Pathological necrosis**(4) **Pylephlebitis with portal pyæmia :****Etiology : Gangrenous appendicitis****Clinic : (a) Rigors**(b) **Jaundice**(c) **Hepatic tender enlargement**(d) **Toxæmia**(5) **Thoracic complications :**(a) **Pleurisy**(b) **Pneumonia**(c) **Empyema**(6) **Femoral or iliac thrombophlebitis**(7) **Septicæmia**

Prognosis Factors

(1) Age: (a) Very bad in children:

- (a) Anatomical causes
- (β) Poor resistance
- (r) Incorrect diagnosis
- (s) Catharsis
- (u) Delay in operation

- So (1) *Never forget appendicitis in children*
 (2) *Never give purgative in acute abdominal pain*
 (3) *Operate immediately once the diagnosis is settled*
 (4) *When in doubt, operate*

(b) Bad in seniles: Due to

- (1) Peritonitis
- (2) Paralytic ileus
- (3) Broncho pneumonia
- (4) Heart failure

(2) Stage:

- Prognosis bad
- (a) Gangrene
 - (b) Perforation
 - (c) Spreading peritonitis
 - (d) Paralytic ileus

(3) Course:

Prognosis bad if operation is forced between 3rd day and 10th day

(4) Type:

Prognosis in the descending order

- (a) Gangrenous Worst
- (b) Obstructive Worse
- (c) Inflammatory Bad

Treatment Of acute appendicitis

(1) Operative treatment

- Time Ind
- (a) Immediate: First 48 hours
Every acute case seen within 48 hours
 - (b) Expectant → secondary operation:
: 48 hours to 10th day
 - (c) Opening of an appendicular abscess:
10th day to 3 weeks
 - (d) Interference for a complication:
Any time it appears
 - (e) Interval operation:
3 weeks to 3 months

(1) Immediate appendicectomy.

Ind. (A) Every acute case seen within 48 hours

(B) *Under the following circumstances .*

- (a) **Age :** (α) *Children under 10*
(β) *Seniles after 50*
- (b) **Sex :** *Pregnant females*
- (c) **Circumstances :**
 - (α) *Diagnosis not certain*
Exploratory laparotomy
 - (β) *Patient not under observation*
 - (γ) *Patient outside available surgical aid*
 - (δ) *Patient not expected in interval period*
- (d) **Previous history :** *First acute attack*
- (e) **Present history :**
 - (α) *Previous morphia*
 - (β) *Previous catharsis*
- (f) **Local examination :**
 - (α) *Pulse above 100*
 - (β) *Hyperæsthesia in Sherren's triangle*
 - (γ) *Signs of perforation*
 - (δ) *Spreading peritonitis*

(C) *Failure of observative expectant treatment :*

- (a) **Pain :**
 - (α) *Continuance after 6 hours rest*
 - (β) *Sudden disappearance*
 - (1) *Morphia*
 - (2) *Perforation*
 - (γ) *Change in character*
• Colicky → continuous peritoneal
- (b) **Vomiting :**
 - (α) *Persistence after 6 hours*
 - (β) *Appearance de novo*
 - (γ) *Change in character*
 - (1) *Peritonism*
 - ↓ (2) *Peritonitis*
 - ↓ (3) *Obstructive: ileus*
- (c) **Pulse and temperature :**
 - (α) *Persistence above 100 after 6 hours*
 - (β) *Rising pulse rate*
 - (γ) *Pulse varying conversely with temp.*
 - (δ) *Sudden fall in temperature*
- (d) **Local examination :**
 - (1) *Hyperæsthesia :*
: *Sudden disappearance*

- (2) Rigidity
 - (a) Spreading
 - (β) Sudden disappearance
- (3) Tenderness
 - (a) Spreading
 - (β) Sudden disappearance
- (4) Mass
 - (a) Spreading
 - (β) Softening → fluctuating
- (5) Skin inflammatory oedema
- (c) **General examination:**
 - (a) General toxæmia
 - (β) Hectic temperature
 - (1) Rigors
- (f) **Special examination:**
 - Leucocytosis
 - (a) Rising
 - (β) *More than 20000*
- (D) *Immediate school of thought*
Operate immediately at any stage
- Except (a) Subsiding inflammatory mass
- (b) Advanced peritonitis with toxæmia
- (2) *Appendicular abscess drainage 10th day to 3 weeks*
 - (A) *Without appendicectomy*
 - (is) *With appendicectomy*
 - Ind (a) History of more than 10 days
 - (b) **Localised fluctuating mass**
 - (c) Inflammatory oedema of the skin
 - (d) General septic toxæmia temp above 100
 - (e) **Leucocytosis > 20000**
- (3) *Complication operations*
At the time of their presence
 - (a) Spreading peritonitis
Appendicectomy and drainage
 - (b) Paralytic ileus
Cecostomy with or without appendicectomy
 - (c) Pylephlebitis
Ileo-colic vein ligation + appendicectomy
 - (d) Residual abscesses
Drainage
- (4) *Interval appendicectomy 3 weeks to 3 months*
 - (a) 3 weeks after a mild attack
 - (b) 6 weeks after a subacute attack
 - (c) 12 weeks after an acute attack

(II) *Observe conservative treatment :*Ind : (A) **Operation contra indicated :**

- (a) Patient *unwilling* for operation
- (b) Patient *too bad*
- (c) Patient *recovering* under expectant treat

(B) **Cases seen 48 hours after onset :**

- (a) *With no special indications for immediate interference* (See above)
- (b) No signs of failure of expectant treatment (See above)

(C) **Appendicular or residual abscesses :**

- (a) Until localised
- (b) Failure of localisation

(D) **Spreading peritonitis :**

- (a) *Early* cases with shock and toxæmia
- (b) *Late* cases

(E) **Chronic appendicular mass**(F) **Circumstances :**

- (a) Good experienced surgeon
- (b) *Patient under constant observation*

Results. (I) **Resolution :** Gradual amelioration of signs

(II) **Failure :**(A) **Perforation :**

- (a) Peritonism shock + vomit
- (b) Sudden relief of
 - (1) Pain
 - (2) Tenderness
 - (3) Hyperæsth

(B) **Gangrene :**

- (a) Loss of pain & tenderness
- (b) Fulminating course
- (c) Toxæmia

(C) **Transmigration of sepsis**(D) **Failure of localisation**(E) **Intestinal obstruction: Paralytic ileus**(F) **Portal embolism**(G) **General toxæmia**

Giving rise to .

- (1) Peritonitis
 - (a) Spreading
 - (b) Residual abscesses
- (2) Paralytic ileus
- (3) Portal pyæmia
- (4) General toxæmia

(III) **Intercurrent complications :**

- (1) Parotitis
- (2) Chest affections

- Advantages** (1) No subphrenic abscess
 (2) No pylephlebitis
 (3) Intestinal obstruction rarer
- Disadvant** (a) Failure at any moment
 (b) Abuse of the method
 (c) Patient not turning up in quiescent period

(1) CONSERVO-OBSERVATIVE TREATMENT

Syn **Ochsner-Sherren**

- Tech** (1) **Fowler's position**
- (2) **Diet:** (a) Nothing by mouth first 48 hours
 (b) Glucose water sips 3rd to 5th day
 (c) Milk diet 5th to 7th day
 (d) Light fluid diet : 7th to 10th day
- (3) **Oral hygiene:** Gargles and lemon
- (4) **Hydrotherapy:**
 (a) Intravenous } Glucose saline
 (b) Rectal }
- (5) **Chemotherapy:** Prontosil, suluseptasine
- (6) **Bowels:**
 (a) No purgatives or laxatives
 Till pulse and temp are normal for a week
 (b) Small glycerine enema
 On the 4th day
- (7) **No morphia**
- (8) **Hot water bag** } to the local part
 or Radiant heat }
- (9) **Observe:**
 (a) **Pain:** (a) Continuance
 (b) Sudden disappearance
 (c) Change in character
- (b) **Vomiting:** (a) Continuance
 (b) Appearance
 (c) Change in character
- (c) **Temp:** (a) Continuance
 (b) Sudden fall
 (c) Changes
 (d) Relation to pulse
- (d) **Pulse:** (a) Persistence
 (b) Rise or fall of rate
 (c) Relation to temp.
- (e) **Constipation or diarrhoea**
- (f) **Local examination:**
 (1) **Hyperæsthesia:**
 (a) Presence or absence
 (b) Sudden disappearance

- (2) **Tenderness :**
 - (α) *Extent*
 - (β) Sudden disappearance
- (3) **Rigidity :**
 - (α) *Extent :* Localising, decreasing, increasing
 - (β) Sudden disappearance
- (4) **Distension :** Local, spreading, general
- (5) **Mass :**
 - (α) Extent . spreading
 - : localising
 - : decreasing
 - (β) Consistency : softening
 - : hardening
- (6) **Implication of skin :** *Edema*
 - : *Redness*
- (g) **Regional examination :**
 - (1) **Pelvis :** (α) *Bowel habit*
 - (β) *P R. or P.V.*
 - (2) **Liver :** *Tenderness enlargement*
 - (3) *Chest*
 - (4) **Oral cavity**
 - (5) **Parotid glands**
- (h) **General examination :**
 - (1) *Temperature*
 - (2) *Toxæmia*
- (i) **Special examination :**
 - : **Leucocytosis :** *Increasing*
 - . > 20000
- (10) **Keep the theatre ready for operation :**
 - . Immediately the signs of failure set in

(II) APPENDICECTOMY :

- (A) **Anæsthesia :**
 - (a) **Spinal**
 - (b) **Local**
 - (c) **General**
- (B) **Incisions :**
 - (1) *Rutherford Morison : muscle cutting*
 - Ind : (α) **Routine for all acute cases**
 - (b) **Drainage of an abscess**
 - (c) **Extra peritoneal retrocæcal appendix**
 - (2) *McBurney : grid-iron*
 - Ind : (α) **Diagnosis certain**
 - (b) **Right iliac appendix**
 - (c) **Isolated appendicitis :**
 - : **With general peritoneum shut off**

- (d) Appendicular abscess
- (e) General exploration not required
- (f) Late stages of peritonitis

(2a) Grid iron enlargement

- (a) Grid iron incision
- + (b) Detachment of int. oblique from rectus
- Ind. McBurrey incision
- + Appendix out of reach on medial side

(3) *Battle*

- Ind. (a) Isolated appendicitis requiring good exposure
- (b) Pelvic or pre ileal appendix
- (c) Access to female generative organs

(4) *Paramedian*

- Ind. (a) Acute attack within 48 hours
- (b) **Diagnosis uncertain**
- (c) **General exploration**
- (d) Pelvic appendix
- (e) Pre ileal appendix
- (f) Interval period

(5) *Median*

- * Ind. Females with concomitant pelvic signs

(6) *Right inguinal femoral*
Incidental

(C) *Steps*

- (a) Opening of the peritoneal cavity
- (b) General inspection of right iliac fossa
For signs of inflammation
- (c) *Isolation from the general peritoneal cavity*
By abdominal sponges
- (d) Protection of wound margins by sponges
- (e) Mobilisation and delivery of the caecum
- (f) Exploration and examination of appendix
Follow the taenia coli
- (g) Fixation of the appendix
Catch by meso appendix
- (h) Ligation and division of meso appendix
- (i) Purse string
- (j) Appendicectomy
 - (a) Cuff method
 - (β) Crush method
 - (γ) Three clamps method
- (k) Treatment of the stump
 - (a) Ligation → cut → carbolic
 - ↓ (β) Burial
 - or (γ) Non burial
 - (1) As a practice
 - (2) Friable appendix

- (3) Friable caecum
- (4) Appendicular gangrene
- (5) Appendicular abscess

(j) Exploration

(a) Quiescent cases

- (1) Pelvic organs
- (2) Ureter & kidney pelvis
- (3) Meckel's diverticulum
- (4) Gastro-duodenum
- (5) Gall bladder
- (6) Intestines

(β) Acute cases

(a) If appendicitis +

- (1) Pelvis (a) Inspection
- (b) Diagnostic swab

(2) Ureter

(3) Meckel

(b) If appendicitis is absent or secondary

Examine as in quiescent cases

Especially (1) Last part of ileum

(2) Pelvic organs

(3) Ureter

(4) Duodenum

(m) Taking out and counting the abdominal mops

(n) Drainage

- Ind (1) Purulent fluid (a) Local
- (b) Pelvic
- (c) General

(2) Perforated appendix

(3) Gangrenous appendix

(4) Faecalith in peritoneal cavity

(5) Partial appendicectomy

Contraind (a) Unperforated appendix

(b) Manipulative perforation

(c) Recent perforation

With serous exudate

Sites (a) Original incision x

(b) Right lumbar stab

2" behind ant. sup. spine

Well above the crest

(c) Suprapubic stab

If diagnostic pelvic swab is +

Material Rubber tissue or tube

Compl (1) Paralytic ileus

(2) Faecal fistula

(3) Secondary haemorrhage

(4) Adhesions

(5) Persistent sinus

(6) Ventral hernia

Points Drainage tube should not be

- (a) Too thick or too thin
- (b) Too long or too short
- (c) Too big or too small
- (d) In relation to
 - (α) Sutures
 - (β) Intestines
 - (γ) Vessels

(e) Kept for too long or too short a time

(D) *Additional procedures in acute appendicectomy*

(1) Ligature of ileo-colic vein

Ind Prophylactic for portal pyæmia

Rigors in the course of appendicitis

(2) Caecostomy

Ind (a) Wide-spread peritonitis

(b) Paralytic ileus

(c) Internal fistula preventive

Tech Tie in de Pezzer catheter in cæcum or appendix stump

(3) Drainage of pelvic abscess

(a) Suprapubic stab

or (b) Rectal drainage

(E) *Difficulties in appendicectomy*

(1) **Pathological**

(a) Acute cases

(α) Adhesions

(β) Hæmorrhage

(γ) Friability

Due to gangrene or œdema

(δ) Paralytic distension

(b) Chronic cases

Adhesions → immobility → inaccessibility

(2) **Anatomical**

(a) Non mobile cæcum

(b) Inaccessible appendix

(c) Fat, friable mesentery

(d) Thin, friable peritoneum

(3) **Anæsthesia**

(a) Rigid abdominal wall

(b) Retching with evisceration

(4) **Technical**

(a) Wrong incision

(α) Inappropriate site

(β) Too small

(b) Futile and rough search for appendix

↓ (1) Tearing of cæcum or appendix

(2) Tearing of adhesions or intestines

(3) Hæmorrhage

(4) Burst abscess

(F) Other methods of appendicectomy in difficult cases**(1) Retrograde appendicectomy**

- Ind (a) Tip not found or handy
 (b) Base more accessible than tip
 (c) Surety of whole appendix being removed

Contraind Whole of the appendix not visible

(2) Submucous resection of appendix

- Ind Buried, friable appendix
 Tech Shelling out the muc. mem

(3) Partial appendicectomy

- Ind (a) Gangrenous friable appendix
 (b) Incorporation in abscess wall

(III) APPENDICITIS WITH PERITONEAL ABSCESS**(A) Observe conservative Ochsner Sherren**

- Ind (1) Localising
 (2) Absorption

Contraind (a) Children
 (b) Failure of expectant treatment

- Tech (a) (See above)
 + (b) Local examination every day
 + (c) Rectal examination every third day

(B) Operative

- Ind (a) Children
 (b) Localisation
 (c) Failure of Ochsner Sherren
 (a) Lump (1) Not smaller after 5th day
 (2) Getting larger
 (3) Visible to the eye
 (b) Burst abscess → peritonitis
 (r) Temp above 100

- (d) History of two to three weeks
 (e) Signs of pointing
 (f) Leucocytosis $> 20\,000$

Tech (1) **Drainage**
 (2) **Drainage + Appendicectomy**

- Steps (1) Anæsthesia eviprin, spinal
 (2) Incision (a) Over the centre of the swelling
 + (b) Upto the abscess wall
 + (c) Divide all layers in one axis
 (3) Protection of margins by sponges
 (4) Isolation of the area by sponges around
 (5) Opening of the abscess
 By (a) Blunt artery forceps
 (b) Finger tip
 (6) Evacuation of pus

- (7) Removal of the appendix
 - (a) Only if free and in the centre of the cavity
 - (b) Never disturb the abscess wall
- (8) Drainage corrugated rubber sheet
- (A) *Retro caecal extra peritoneal abscess*
 - (1) Incision
 - (a) Centre of the swelling
 - or (b) Rutherford Morison
 - (2) Tech do not open the peritoneal cavity
 - (3) Drainage
 - (a) Stab in the right loin
 - or (b) Outer angle of the wound
- (B) *Right iliac intra peritoneal abscess*
 - (1) Incisions
 - (a) Local
 - (a) Centre of the swelling
 - (β) As much lateral as possible
 - (γ) Rt angles to grid iron
 - or (b) Grid iron
 - or (c) Morison
 - (2) Divide all layers in the same axis
 - (3) Open by finger
 - (4) Always explore the pelvis
 - (a) Inspection
 - (b) Dry sponge test
 - (5) Drainage
 - (a) Incisional
 - or (b) Right lumbar
- Diff
 - (1) Failure of location
 - (2) Unresolved hard mass

Leave alone close the abdomen
 - (3) Injury to caecum or intestines faecal fistula
 - (4) Burst open in general cavity peritonitis
- (C) *Pelvic abscess*
 - (1) *If with appendicectomy or iliac abscess*

Incisions

 - (a) For appendix or iliac abscess
 - (a) Centre of the swelling
 - or (β) Paramedian
 - or (γ) Morison
 - (b) For pelvic abscess
 - (a) Suprapubic stab
 - or (β) Rectal
 - (2) *If detected or suspected independently*
- Diagnosis
 - (a) History
 - (b) Free discharge of mucus per anum
 - (c) P R soft cystic swelling
 - (d) Absence of abdominal rigidity

Drainage: (A) Blind rectal:

Ind: Pointing into the rectum

Pre oper: Empty the bladder

: Wash the rectum

Anæsth: Low spinal

: Evipan

Posture: Exaggerated lithotomy

Tech: (a) Speculum: (mucus drop)

↓ (b) Hilton's method

↓ (c) Drainage tube

↓ (d) Fixation to anus: for 4 days

(B) Exploratory laparotomy:

↓ Identification and closure

↓ Rectal drain

Ind: Associated appendix trouble

(C) Posterior colpotomy.

Ind (a) Pointing to rectum

+ (b) Married women

(D) Suprapubic

Contraind: Soiling of general peritoneum

(IV) APPENDICITIS WITH SPREADING PERITONITIS:**(A) Observo-conservative: Ochsner-Sherren**

Ind: (a) Early cases: With shock and toxæmia

(b) Advanced cases: After 60 hours

Contraind: (1) Childhood

(2) Recent perforation of appendix abscess

Tech: (a) Ochsner-Sherren

(b) Intravenous (α) Glucose saline

(β) Anti gas gangrene

(γ) Sulphonamide group

(B) Operative:

Ind: (a) Early cases

(b) Recent perforation

(c) Local advanced signs: right iliac peritonitis

: With mild general peritonitis

(d) Good general condition

(e) Oncoming or early paralytic ileus

(f) Children

Tech: (1) Appendicectomy

+ (2) Drainage: (a) Suprapubic

(b) Lumbar

+ (3) Cæcostomy

Pre. & post oper:

(a) Intravenous (α) Hydrotherapy

(β) Chemotherapy

(γ) Blood transfusion

(b) Duodenal suction tube

(c) Morphine + pitressin

Post operative treatment of appendicectomy

- (1) **Position :** (a) High Fowler
(b) Flexed hips
(c) Pillow under left loin if abscess
- (2) **Diet :** (a) Glucose water sips 2 days
↓ (b) Citrated milk + barley 2 days
↓ (c) Citrated whole milk 2 days
↓ (d) Milk + Benger + biscuits 2 days
↓ (e) Light diet
- (3) **Bowels :** (1) Glycerine syringe 4th day
(2) Liquid paraffin from 5th night
(3) No purge for three weeks
- (4) **Lungs** (a) Deep breathing
(b) Anti pneumonic prophylaxis
(c) A S A injections
- (5) **Wound :**
(A) If clean (a) Redress 4th morning
↓ (b) Sutures out on 11th day
but (c) Open if pyrexia
(B) If septic (1) Dress daily
(2) Cut sutures under tension
(C) If drainage
(a) Keep for three days daily rotate
↓ (b) Remove → clean → insert
As long as discharge +
↓ (c) Daily shorten → take out
When discharge diminishes
- (6) **Mouth hygiene** Gargle analogues
- (7) **Intravenous therapy.**
(a) Glucose in all acute cases
(b) Saline in shock, vomiting, peritonitis
(c) Anti gas gangrene in peritonitis
(d) Mercurochrome 10 c.c.s
In peritonitis pylephlebitis
(e) Sulphonamide group

Post-compl (1) Shock**Time** Within 24 hours

Causes (a) Septic toxæmia
(b) Rough handling
(c) Prolonged anaesthesia

Treat Anti shock**(2) Acute gastric dilatation****Time** 24-72 hours

- Treat (a) Postural + gastro duodenal drainage
(b) Hydro therapy

(3) Peritonitis :

Time Pre operative → post operative 6 days

- Causes (a) Pre operative
(α) Gangrene
(β) Perforation
(γ) Transmigration
(δ) Burst abscess
(b) Operative
(1) Soiling of general peritoneum
(2) Damage to barriers
(c) Post operative bursting appendix stump

- Treat (A) Pre operative
(a) Intravenous
(1) Hydro therapy
(2) Gluco therapy
(3) Sero therapy
(4) Chemo therapy
(b) **Ochsner Sherren**

- ↓ (B) Operative
(a) Gentle handling
(b) Non soiling
(c) **Appendicectomy**
(d) Drainage
(e) Prophylactic caecostomy

- ↓ (C) Post operative
(α) As under (A)
(β) Attention to drainage

(4) Paralytic ileus .

Time Pre operative → post operative 6 days

- Causes (a) Peritonitis
(b) Mal handling
(c) Drainage tube
(d) Residual abscess

- Treat (A) Conservative (See under Paralytic Ileus)
(B) Operative
(1) **Caecostomy**
(2) Jejunostomy

(C) Treatment of etiology

(5) General peritoneal toxæmia or septicæmia .

Time Pre operative → post operative

- Treat (a) Gastro duodenal suction drain
(b) Intravenous
(1) Hydro therapy
(2) Gluco therapy

- (3) Sero therapy
- (4) Chemo therapy
- (5) Hæmo-therapy

(6) Wound infection :

Time	Post operative 5th-15th day
Varieties	(1) Stitch abscess (2) Mural abscess (3) Cellulitis (4) Gangrene (a) septic, (b) anaerobic (5) Burst abdomen (6) Secondary hæmorrhage
Causes	(a) Gangrenous or perforated appendix (b) Appendix abscess (c) Peritonitis (d) Drainage tube
Treat	(1) Removal of an infected suture (2) Removal of many stitches + Mag sulph glycerine pack (3) Sero therapy (4) Chemo therapy

(7) Fæcal fistula :

(A) External :

Time	6th to 10th day
Causes	(a) " (b) " (c) " (d) Mal handling (e) Prolonged drainage tube
Treat	(1) Conservative : For three months (a) Restrict fluids and food (b) Astringents bismuth & opium (c) Protective dressings (d) Bowel lavage ↓ (2) Operative (a) Closure (b) Short circuit (c) Excision

(B) Internal :

Time	4th or 5th day
Cause	Early large enema
Path	Bursting appendix stump
Clinic	General peritonitis
Treat	(a) Prophylactic caecostomy (b) Therapeutic open and drain

(8) Pylephlebitis → Portal pyæmia :

Time : Pre-operative → post operative 10 days

- Causes : (a) Fulminating (gargreous) appendicitis
 (b) Inopportune appendicectomy
 (c) Mal handling of tissues or abscess wall

- Clinic : (1) Rigors with hectic temperature
 (2) Icterus
 (3) Enlarged and tender liver

- Treat : (A) Prophylactic :
 (a) **Ligature of ileo-colic vein**
 (b) Choose the best time for operation
 (c) Do least possible
 (d) Delicate handling
 (B) Therapeutic :
 : Intravenous (a) Chemo-therapy
 (b) Hæmo therapy

(9) Residual abscesses :

Time : Pre operative → post operative 1 month

Sites : (A) **Right iliac abscess :**

Treat : Drainage

(B) **Pelvic abscess :**

- Causes (a) Pelvic or promontoric appendix
 (b) Peritonitis with Fowler position
 (c) Leaking right iliac abscess

- Clinic . (a) Diarrhœa with mucus
 (b) General septic toxæmia
 (c) P R. soft cystic swelling
 (d) Leucocytosis $> 20,000$

Treat Rectal drainage

(C) **Sub-phrenic abscess :**

- Clinic (a) Local peritonitis
 (b) Basal chest signs
 (c) General toxæmia

Treat Drainage

(D) **Perinephric abscess :**

Cause . Retrocæcal appendix

- Clinic (a) Local signs
 (b) Urinary signs
 (c) General signs

Treat : Drainage

(E) **Left iliac abscess :**

Cause : Overflowing pelvic abscess

- Treat : (1) Rectal drain
 (2) Suprapubic drain

(F) **Central abscess :**

- Cause : (a) Pre ileal appendix
 (b) Medial bursting of appendix abscess

Clinic (1) Paralytic ileus. local → general
 ↓ (2) Peritonitis

Treat Exploration and drainage

(10) **Intestinal obstruction :**

(A) **Primary :**

Time Pre operative

Cause Appendix acting as a band

(B) **Adhesive :**

Time (a) Pre operative adhesions

(b) Post operative adhesions and bands

(α) Early 6-10 days

(β) Mid 3rd week (Pelvic peritonitis)

(γ) Late after 3 months to years

(C) **Paralytic (See paralytic ileus above)**

Time 48 hours after the cause

Cause (a) Local appendicular sepsis

(b) Residual abscess

(c) General peritonitis

(d) Exposure and operative trauma

(e) Too prolonged or faulty drainage tube

(f) Toxaemia

(D) **Functional : Constipation**

Treat Treat the cause

(11) **Chest complications :**

Time Post operative (a) 24 hours to 5th day

(b) Any time if embolism

Varieties (a) Lungs Pneumonia

Edema

Collapse

Embolism

(b) Pleura Pleurisy → empyema

Causes (1) Toxaemia

(2) **Anæsthesia :** Aspiration, irritative

(3) **Hypostatic**

(4) Subphrenic abscess

Treat Prophylactic and therapeutic anti pneumonic

+ (1) Deep breathing

+ (2) A S A injections

(12) **Urinary complications :**

Time Pre operative → post operative catheter period

Varieties (a) Urethritis

↓ (b) Cystitis or epididymo-orchitis

↓ (c) Ureteritis

↓ (d) Pyelitis

- Causes** (1) **Spread from appendix .**
 (a) Pelvic
 (b) Promontoric
 (c) Retrocæcal
 (2) **Residual abscess contact :**
 (a) Pelvic
 (b) Perinephric
 (3) Associated independent condition
 (4) **Catheterisation** Post operative
Treat (a) Remove the cause
 (b) Urinary antiseptics

(13) Parotitis

- Time** Post operative 4th → 7th day
Causes Sepsis ascending from oral cavity
 (a) Intestinal toxæmia
 (b) Starvation
 (c) Dehydration → desalivation
Clinic (1) Painful trismus
 ↓ (2) Fullness in parotid area
 ↓ (3) Parotid inflammation
 ↓ (4) Parotid abscess
Treat (A) Prophylactic
 (1) **Mouth hygiene** gargles
 (2) **Sialogogues : lemon**
 (3) Hydro therapy
 (4) Treat constipation
 (B) Curative
 (1) Prophylactic
 + (2) Fomentations
 + (3) Counter irritants
 ↓ (4) Incision and drainage

(14) Thrombo phlebitis .

- Time** Upto convalescence
Sites (a) Iliac vein
 (b) Femoral vein
 (c) Saphenous vein
Causes (1) Pressure of drainage tube
 (2) Debility + circulatory stasis
Clinic (a) Local examination cord like feel
 (b) Distal examination œdema foot & leg
 (c) Rise in temperature and pulse
Compl (a) Distal œdema
 (b) Embolism
Treat (A) Prophylactic
 (a) Mobility of extremities
 (b) Circulatory stimulants

(B) Therapeutic

(a) Absolute fixation in elevation
: For 3 weeks↓ (b) Massage and elastoplast
: After 3 weeks

(15) Abnormal scar :

Time Post operative upto 6 months

Varieties (A) Persistent sinus :

Causes (a) Prolonged drain

(b) Unabsorbable septic suture

(c) Tuberculosis or actinomycosis or
regional enteritis

Treat (1) Treat the cause

(2) Curettage

(B) Painful scar :

Treat Under cutting

(C) Septic scar :

Cause Underlying sepsis

Clinic Tender oedematous scar

Treat Explore and drain

(D) Keloid :

Cause. (a) Friction

(b) Sepsis

Treat (a) Apply collodion

(b) Avoid friction

(F) Distal anaesthesia or neuralgia :

Cause Trauma to the sensory nerve

(F) Ventral incisional hernia :

Time Post operative 3 to 6 months

Causes (a) Septic wound

(b) Lack of rest straining

(c) Prolonged drainage

(d) Nerve trauma

(e) Burst abdomen partial

(f) Subsequent pregnancy

Treat (A) Prophylactic

(a) Avoidance of etiology

(b) Avoidance of strains

(c) Abdominal binder for 3 months

(B) Therapeutic Gullie's fascioplasty

(16) Inguinal hernia :

Time Post operative after 3 months

Cause Trauma to ilio inguinal nerve

(a) Operative trauma

(b) Drainage through McBurney

Clinic (a) McBurney scar
 (b) History of drainage
 (c) Inguinal hernia
 Treat Gallie's hernioplasty

IMPORTANT POINTS

- (1) *Rigidity and pain in right iliac fossa with high temp*
 - (a) *Acute appendicitis*
 - (b) *Acute pyelitis*
 - (c) *Duodenal perforation*
 - (d) *Right sided basal pneumonia*
- (2) *Classical indications for Ochsner Sherren*
 - (a) *More than 3 days history*
 - + (b) *Pulse not above 90*
 - + (c) *Localised mass*
- (3) *Main contra indications for Ochsner Sherren*
 - (1) *History of less than 48 hours*
 - (2) *Children and seniles*
 - (3) *Uncertain diagnosis*
 - (4) *Patient outside constant observation*
 - (5) *History of catharsis*
 - (6) *Recent perforation or gangrene appendix*
 - (7) *Rising pulse rate*
- (4) *Appendicitis in pregnancy*

Diff diag (a) *Pregnancy pyelitis*
 (b) *Pregnancy vomiting*
 (c) *Ruptured tubal gestation*
 (d) *Twisted ovarian cyst*

Compl *Abortion*

Treat *Ignore the pregnancy*
Treat the appendix
- (5) *Grid iron McBurney incision is the best one for removal of an acutely inflamed appendix*
- (6) *Swinging temperature with fast pulse after appendicitis or appendicectomy*
 - (a) *Abdominal wall abscess*
 - (b) *Residual abscess*
 - (c) *Pylephlebitis*
 - (d) *Parotitis*
 - (e) *Lung complications*
 - (f) *Urinary sepsis pyelitis*
 - (g) *Thrombo phlebitis*
- (7) *Every case of acute appendicitis, examine*
 - (a) *The right lung*
 - (b) *The right kidney*

- (c) The right testis
 - (d) The right tube
 - (e) The duodenal area
- (8) Special signs in acute appendicitis
- (a) Rovsing acute appendicitis
Pain in right iliac fossa on pressure over left iliac fossa.
 - (b) La Roque gangrenous appendicitis
Retraction of right testis on pressure over McBurney
 - (c) Psora's test iliac appendix
Pain on extension + abduction of thigh
 - (d) Obturator test pelvic appendix
Pain in hypogastrium on flexion + inversion of thigh
 - (e) B " " " " " "
the straight right leg maintained on the most tender spot in the flank
 - (f) Altschuler retrocaecal appendix
Tenderness and localised muscle spasm situated over the right pelvic margin from ant sup iliac spine downwards
- (9) In appendicectomy
- (a) Never cut through inflamed and adenomatous omental adhesions
 - (b) Never hook out acutely inflamed adherent appendix
- (10) On no account tear through the hard indurated appendix mass with the finger in an endeavour to find central pus, fecal fistula is the invariable result of the procedure
- (11) In operation for acute appendicitis if the diagnosis is confirmed during operation do not explore the upper or left part of the abdomen as sepsis may be carried manually in non-septic parts.
- (12) Do not fail to explore pelvis in all cases of acute appendicitis except in retro-caecal cases. Do the diagnostic swab test
- (13) Beware of putting a patient into Trendelenburg position in lower acute abdomen as the pus may gravitate and infect the upper abdomen also
- (14) In every acute abdomen with a diagnosable local focus, the posture should be such that the local focus is always in the most dependant position, so that the septic discharges do not gravitate into the virgin parts of the peritoneal cavity. Same is true of post-operative drainage
- (15) Do not handle acute appendix roughly, as the localisation may break at any time

- (16) There are many surgeons who believe that to delay operation in any stage of acute appendicitis is to gamble with death
- (17) In general peritonitis, determine whether the appendicitis is primary or secondary, by inspection of the region and slitting open the organ
- (18) *Never forget to palpate the right ureter before appendicectomy, as an impaction of a stone in abdominal ureter gives all the signs of acute appendicitis*
- (19) Remember that some cases of duodenal perforation simulate acute appendicitis
- (20) *It is criminal to give Ochsner Sherren treatment outside a surgical hospital or nursing home or unless the patient is under the direct observation of the surgeon all the time. In fact 'Ochsner Sherren treatment must be carried out on the threshold of an operation theatre'*
- (21) It is criminal to fail to explain to the patient the dangers of not turning up for interval operation after the successful Ochsner Sherren treatment
- (22) *In every case of acute abdominal pain with vomit*
Never give (a) *Morphia*
 (b) *Purgative*
 (c) *Big enema*
- (23) Post operative complications of appendicectomy
- (I) Abdominal
- (A) Superficial
- (a) Early (1) Stitch abscess
 (2) Cellulitis
 (3) Gangrene
 (4) Burst abdomen
- (b) Late (1) Abnormal scar
 Painful
 Infected
 Anaesthetic or neuralgic
 Keloid
 Sinus
 (2) Ventral hernia (Incisional)
 (3) Inguinal hernia
- (B) Intra abdominal
- (a) Early (1) Peritonitis
 (2) Acute dilatation stomach
 (3) Paralytic ileus
 (4) Residual abscesses
 (5) Faecal fistula
 (6) Portal pyæmia
- (b) Late Intestinal obstruction
 (1) Adhesive
 (2) Functional

- 1) Other systems
 - (A) Oral Parotitis
 - (B) Chest
 - (a) Lungs Pneumonia
Oedema
Collapse
Embolism
 - (b) Pleura Pleurisy
Empyema
 - (C) Urine
 - (a) Urethritis → epididymo orchitis
 - ↓ (b) Cystitis → ureteritis → pyelitis
 - (D) Thrombo phlebitis
- (III) General
 - (A) Septicæmia
 - (B) Toxæmia
 - (C) Portal pyæmia
 - (D) Shock

- (24) Blind rectal drainage should be reserved for those cases where the diagnosis of pelvic abscess is a certainty
 - (a) History
 - (b) Mucus per anum
 - (c) P. R. soft cystic swelling
 - (f) Absence of abdominal rigidity
- (25) *Oedema of a scar denotes deep lying residual abscess*
- (26) *Never give a large enema on the 1st day after appendicectomy* as it causes bursting of appendicular stump leading to internal fecal fistula.
- (27) *Aperients in acute appendicitis mean peritonitis*
- (28) Drain in appendicectomy when appendix is
 - (a) Gangrenous
 - (b) Perforated
 - (c) Irriable and urdematous
 - (d) Pus filled
 - (e) Associated with spreading peritonitis.
- (29) Spinal anæsthesia is the best in appendicectomy
- (30) *Acute appendicitis is the most common cause of inflammatory acute abdomen*
- (31) *Most important sing'e sign of appendicitis is tender McBurney's point, which is a point on the right spino umbilical line about 1.5"-2" from the ant. sup spine*
- (32) Important factors in the clinical features of appendicitis
 - (a) Virulence and character of the attack
 - (1) Fulminating
 - (2) Acute
 - (3) Subacute
 - (4) Chronic
 - (5) Relapsing
 - (6) Recurrent

- (b) Stages
 - (1) Pure appendicitis
 - (2) Appendicitis + regional peritonitis
 - (3) Appendicitis + spreading general peritonitis
- (c) Pathological types
 - (1) Inflammatory
 - (a) Catarrhal
 - (β) Suppurative
 - (2) Obstructive appendicular obstruction
 - (3) Thrombotic gangrenous appendicitis
 - (4) Fibrotic chronic appendicitis
- (d) Anatomical positions
 - (1) Retrocaecal
 - (2) Iliac mid inguinal
 - (3) Promontoric
 - (4) Pelvic
 - (5) Pre ileal
 - (6) Sub hepatic
- (e) Associated complications
 - (1) Residual abscesses
 - (2) Spreading peritonitis
 - (3) Intestinal obstruction
 - (4) Pylephlebitis → portal pyæmia.
- (33) Differential diagnosis of appendicitis
 - (a) Thoracic causes basal inflammations
 - (b) Spinal causes Pott's disease
 - (c) Urinary causes pyelitis, ureteral stone
 - (d) Pelvic causes salpingitis
 - (e) Testicular causes acute torsion
 - (f) Gastro duodenal causes peptic ulcers
 - (g) Intestinal causes acute obstruction
 - (h) Biliary causes cholecystitis
 - (i) Regional causes iliac lymphadenitis
- (34) It is dangerous to hook out an appendix blindly, it may lead to
 - (a) Perforation
 - (b) Hæmorrhage
 - (c) Injury to external iliac artery
- (35) *The safest method of delivery of an appendix is gentle traction on the cæcum*
- (36) *If appendix or cæcum refuses to come out, enlarge the incision*
- (37) *Best way to get at the appendix is to follow the taeniæ coli to their origin*
- (38) Appendix cannot be found
 - (a) Wrong orientation

- (b) Whole of the appendix buried :
 - (a) In cæcal wall
 - (β) Retrocæcal
 - (γ) By adhesions
- (c) Intussusception : appendicular
- (d) Previously taken out : through hernial incision
- (39) Common difficulties in appendicectomy :
 - (1) Rigidity of abdominal wall
 - (2) Straining
 - (3) Fixed cæcum
 - (4) Ill-placed incision
 - (5) Adhesions
 - (6) Friability of tissues.
- (40) *In retrograde appendicectomy, the whole course of appendix must be visible before the operation is commenced, so that there is no likelihood of the gangrenous tip left behind.*
- (41) *Acute right iliac inflammation :*
 - (a) *Acute appendicitis*
 - (b) *Tuberculous typhilitis*
 - (c) *Typhoid perforation*
 - (d) *Meckel's diverticulitis*
 - (e) *Salpingitis*
 - (f) *Pyelitis or ureteritis*
 - (g) *Iliac lymphadenitis.*
- (42) *Appendicitis without rigidity of anterior abdominal wall :*
 - (a) *Pelvic appendicitis*
 - (b) *Retro caecal appendicitis*
 - (c) *Pure appendicitis without peritonitis*
 - (d) *Recent perforation*
 - (e) *Gangrenous appendicitis*
 - (f) *Appendicular obstruction*
 - (g) *Late general peritonitis . paralytic ileus*
- (43) *Significance of symptoms in appendicitis .*
 - (a) *Hyperæsthesia in Sherren triangle .*
: *Unperforated tense appendix*
 - (b) *Disappearance of already present hyperæsthesia :*
 - (a) *Gradual . amelioration*
 - (β) *Sudden . perforation or gangrene*
 - (c) *Temperature .*
 - (a) *Normal upto 100.5*
 - (β) *Sudden drop . perforation*
 - (γ) *Sudden rise :*
 - (i) *Residual abscesses .*
 - (1) *Abdominal wall*
 - (2) *Right iliac*
 - (3) *Pelvic*
 - (4) *Left iliac*

- (5) Central
- (6) Subphrenic
- (7) Perinephric
- (ii) Portal pyæmia
- (iii) Pneumonia
- (iv) Urinary sepsis
- (v) Parotitis
- (vi) Phlebitis
- (δ) Inverse relation to pulse
Deterioration in the condition
- (d) Pain
 - (α) Colicky
 - (1) Unperforated tense appendix
 - (2) Obstructive appendicitis
 - (3) Appendicular obstruction
 - (β) Continuous
 - (1) Peritonitis
 - (2) Distension
 - (1) Sudden disappearance
 - (1) Perforation
 - (2) Gangrene
- (e) Vomiting
 - (α) Single, non repeated peritonism
 - (β) Appearance de novo
 - (a) Perforation
 - (b) Peritonitis
 - (γ) Small, repeated peritonitis
 - (δ) Regurgitant ileus, obstruction
- (44) *Acute appendicitis is the most common cause of faecal fistula*
- (45) Indications for immediate operation
 - (a) Children seniles, pregnancies
 - (b) Within 48 hours
 - (c) Perforation or gangrene
 - (d) Appendicular localised abscess
 - (e) Appendicular spreading peritonitis
 - (α) Not too early
 - (β) Not too late
 - (f) History of catharsis
 - (g) Patients not under continuous observation
 - (h) Failure of conservative treatment
 - (i) Patients going out of surgical help
 - (j) Patients who may not turn up for interval operation.
- (46) *Most important guiding sign in observation period is pulse, pulse over 100 or steady rise in pulse rate is an enough indication for immediate operation*
- (47) *Isolation from the general peritoneal cavity is one of the most important steps in operation for acute appendicitis*
- (48) *Never drain through McBurney incision, as it leads to trauma to the ilio inguinal nerve with resultant post operative inguinal hernia.*

- (49) Treatment of acute appendicitis.
: Two schools of treatment:
(a) Operative: Operate at any stage
Contraind. (a) Subsiding mass
(β) Late toxic stage
(b) Observe-conservative.
Contraind. (a) Cases within 48 hours
(β) Special indications for operation.
(1) History catharsis
(2) Age two extremes
(3) Perforation and gangrene
(4) Ripe abscess
(γ) Inconveniences and failure of the treatment
- (50) *In differential diagnosis of acute abdomen.*
(1) *Diagnose between medical and surgical conditions*
(2) *Diagnose between referred and abdominal conditions*
(3) *Diagnose between extra peritoneal and intra peritoneal conditions*
(4) *Diagnose between*
(a) *Immediate operation conditions*
(b) *Conservative treatment conditions*
- (51) *Acute appendicitis*
- (52) *Acute appendicitis* but on
(a) *Remember typhoid perforation.*
- (53) Acute appendicitis syndrome with medial tenderness.
? Meckel's diverticulitis.
- (54) *When a patient is seen during the first 50 hours of an attack of acute appendicitis, no question arises as to the best treatment, it is agreed universally that the appendix should be removed immediately on diagnosis*
- (55) Hæmo peritoneum from a slipped ligature on the meso appendix is not rare, so always transfix it
- (56) Some points on technique
(a) The most dangerous appendix for an attempt to hook it out, is the one situated on the promontory or in the pelvis
(b) The safest way of delivering the appendix is by gentle traction on the caecum
(c) *If the appendix does not come out kindly, it means that more room is required*
(d) External iliac artery may feel very like the continuation of a pelvic appendix.

- (57) In pelvic peritonitis, a suprapubic incision through a special stab above the pubes is a life saving measure
- (58) Peritonitis with secondary appendicitis
 - Primary focus (a) Perforated duodenal ulcer
 - (b) Perforated typhoid ulcer
 - (c) Perforated diverticulitis
- (59) *Conservative treatment of appendicitis must be carried out on the threshold of an operation theatre by the surgeon himself, keeping the theatre ready all the time it is criminal to attempt this treatment in a slip shod way or as a half hearted measure*
- (60) *A rising pulse rate in the early stages is the most reliable single sign that it is dangerous to proceed with delayed treatment, if the pulse rate has increased even ten points in the first four hours operation is indicated*
- (61) A moderate rise of temperature with a pulse rate in eighties or nineties, does not foretell failure of Ochsner Sherren treatment
- (62) If delayed treatment fails and the patient has been starved for some days, the urine should be examined for acetone before anæsthesia in any case give glucose saline.
- (63) The chief danger of Ochsner Sherren lies in its abuse as is true of most good things.
- (64) *The rule 'where there is pus you must let it out' may be broken in the case of small or moderate sized appendix abscess*
- (65) Question of removing the appendix at the time of evacuation of appendix abscess never arises Evacuate only frank abscess.
- (66) After drainage of the appendicular abscess, the interval period must be lengthened to at least 4 to 6 months before appendicectomy is done
- (67) Diff diag of appendicular abscess
 - (1) Ballooned cæcum
 - (b) Twisted ovarian cyst
 - (c) Perforated diverticulitis
 - (a) Meckel
 - (β) Colon
- (68) Most characteristic symptoms of appendicular pelvic abscess are (a) Diarrhœa
(b) Mucus per anum.
- (69) Passage of mucus per anum occurring for the first time in a patient who has or has recently had an attack of acute appendicitis is pathognomonic of pelvic abscess
- (70) Blind rectal drainage should be reserved for those cases where

- (a) History
- (b) Freely discharged of pus per anum
- (c) " " " " " " " "
- (d) " " " " " " " "

• Make the diagnosis of pelvic abscess pointing into the rectum absolutely undeniable, if there is slightest doubt, perform exploratory laparotomy, if the diagnosis of pelvic abscess walled off from general peritoneal cavity is confirmed, close the abdomen and drain via rectum.

- (71) Best line of treatment in perforated appendicitis with general peritonitis

- (a) Expeditious removal of appendix
- (b) Suprapubic drain
- (c) Cæcostomy or enterostomy

- (72) *In appendicitis with general peritonitis for more than 60 hours duration, the appendix is sure to be matted with neighbouring structures and therefore dangerous to be removed, under such circumstances, delayed treatment is the only chance except.*

- (a) *In childhood and early adolescence*
- & (b) *Recent perforation of an appendix abscess*

- (73) Acute appendicitis is not infrequent and a supremely important complication of pregnancy and if only the diagnosis can be established within 48 hours from the onset, appendicectomy must be done.

- (74) Some conditions simulating acute appendicitis

- (a) Perforated diverticulitis of the colon
- (b) Regional ileitis
- (c) Meckel's diverticulitis
- (d) Torsion of
 - (1) Great omentum
 - (2) Appendix epiploicae
 - (3) Ovarian cyst
 - (4) Testis

- (e) Suppurating deep iliac glands

- (75) Drainage in appendicitis

• A strip of small rubber dam inserted through a stab wound and removed within a few days. Insert another strip in the muscle layers.

- Indications
- (a) Perforated appendix
 - (b) Gangrenous appendix
 - (c) Soiled peritoneum

- (76) Appendix mass always treat conservatively

- (a) Resolution interval appendicectomy
- (b) Abscess. drainage at appropriate time
- (c) Acute exacerbation immediate operation

- (77) Haemorrhagic nephritis, B coli urinary infection and renal calculi may be subsequent sequelae of acute appendicitis

- (78) Prophylactic anti gas gangrene and anti coli sera are good prophylactics as pre and post operative measures in acute appendicitis
- (79) Perforation is a sequel of appendicitis and with its appearance mortality enters the field
- (80) *Where there is suspicion of any intra abdominal catastrophe, it is wiser to operate than to court the greater disaster which may be implied in delay*
- (81) Three great evidences of appendicitis are
 (a) Subjective abdominal pain
 (b) Local tenderness
 (c) Muscular rigidity
- (82) *The site of the local tenderness is a fairly accurate guide to the situation of the appendix*
- (83) Pelvic appendicitis is peculiarly liable to be overlooked
 (a) Suprapubic pain
 (b) Indefinite tenderness
 (c) Variable and inconstant rigidity
- (84) Children do not tolerate Ochsner regime as readily as adults
- (85) In child appendicitis, take the following attitude
 (a) If the diagnosis is clear
 Advise operation at the earliest opportunity
 (b) If there is doubt
 Clear it up by operation than to incur the risks entailed in temporising
- (86) Cathartics cause increased intra appendicular pressure with an increased risk of rupture and dissemination of infection
- (87) *Never give a purge to the child who complains of abdominal pain till appendicitis is excluded*
- (88) Suturing of muscles and fascia in the presence of gross infection causes sloughing and mixed or anaerobic infection. It is better to leave the wound open with flaine paraffin pick or in mild cases to drain the inter muscular planes
- (89) Three basic methods of dealing with the appendix stump
 (a) Simple ligature
 (b) Ligature, carbolicisation and burial
 (c) Burial without ligature
- (90) 'Fool's paradise stage in acute appendicitis
 (a) Clinic reduction of pain, tenderness and rigidity
 (b) Pathology *gangrenous bursting appendix*
 (c) Diagnosis (a) History
 (b) Right iliac tenderness
 (1) Leucocytosis.
- (91) *Acute appendicitis with rigors think of oncoming pylephlebitis which must be treated by ligation of ileocolic vein to prevent the portal phlebitis*

- (107) *Pain of acute appendicitis rarely begins in the right iliac fossa; it begins usually round about the umbilicus or in the epigastrium and settles down secondarily in the right iliac fossa*
 - (108) *In every case of abdominal pain in children, exclude worms before any surgical diagnosis is made*
 - (109) *Passing a drainage tube via an appendix incision into the pelvis is most condemnable due to hæmorrhage from pressure necrosis of external iliac artery*
 - (110) *McBurney's incision should be reserved for interval cases Battle's incision will suffice for all early acute cases and for those cases in which diagnosis is in doubt especially in females Except where a general exploration is necessary the oblique muscle cutting Morison incision is better than any others for appendicular abscess*
-

CHAPTER VII

THE RECTUM AND THE ANAL CANAL

(I) CONGENITAL ABNORMALITIES:

(1) RECTAL MALFORMATIONS

(A) *Non or ill-development of proctodeum :*

- (1) No trace of anal opening
- (2) Anal depression with no trace of rectum
- (3) Anal depression with impulse on straining
- (4) Complete septum at the level of anal sinuses
- (5) Perforated septum at the anal sinuses
- (6) Stricture at the ano rectal junction

(B) *Non or ill development of allantoic gut :*

- (1) Rectum ending blindly at the prostate or cervix
- (2) Fibrous cord between high rectum and proctodeum

(C) *Persistence of cloacal communication :*

Clinic Rectum opening into uro genital sinus

- (1) Males (a) Bladder
(b) Urethra
(c) Perineum

(2) Females navicular fossa

Path Imperfect formation of septum between rectum and uro genital organs

Clinic *Of rectal malformations*

- (1) Ano rectal stricture or septum
- (2) Large gut acute obstruction
 - (a) Within first three days of birth
 - (b) Prominent distension
 - (c) Absent defecation
 - (d) Local examination
- (3) Recto vaginal fistula
 - (a) Absence of anus at normal site
 - (b) Rectal opening in navicular fossa

Diag (A) Differentiate from

- (a) Duodenal septum
- (b) Ileal atresia
- (c) Volvulus neonatorum

(B) Determine whether the rectum is near or far

- (a) Impulse on crying
- (b) X Ray in reversed position
- (c) Aspiration not deeper than 5"

- Treat. (1) Anal septum
: **Cruciate incision** → digital dilatation
- (2) Anal depression
+ Impulse on straining
+ Aspiration positive } : **Perineal anus**
- (3) No trace of rectum
+ Aspiration negative
+ Condition advanced } : **Left inguinal colostomy**
- (4) Recto-vaginal fistula
Stone's anal transplantation through intact levator ani (Med Ann 1938)

Sequelæ *Of perineal anus*

- (1) **Stricture**
(2) **Incontinence**
(3) **Prolapse**

(2) **POST-ANAL ABNORMALITIES**

(A) **Post sacrococcygeal**

- (a) **Fovea coccygea**
Syn Post-anal dimple
Clinic Blind pit beneath the tip of the coccyx
Site Posterior to the sacrum and coccyx
- (b) **Post anal dermoid or sinus**
Syn Pilonidal cyst or sinus
Etiology Congenital
Age Between 17 and 30
- Cause (a) Sequestration dermoid
(b) Lack of closure of neurenteric canal
- Path (1) Squamous epithelial lining
(2) Contain hair
- Site (a) Post anal
+ (b) Midline
+ (c) Posterior to sacrum and coccyx
- Clinic (1) Tender swelling
or (1) Sinus (a) Lined by skin
(b) Discharging pus and hair
(2) Site (a) Midline
(b) Posterior to sacrum and coccyx
- Diff diag Fistula in ano
- Complication Inflammation → abscess
- Treat (1) Excision and drainage
(2) Excision and packing

(B) **Pre-sacrococcygeal**

- (a) **Cysts**
Origin (α) Perineal dermoids
(β) Neurenteric canal
(γ) Post anal gut
- (b) **Tumours Teratomata**

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(II) RECTAL TRAUMA:**(I) INJURIES OF THE RECTUM**

- Etio** (A) **Impalement**
 (B) **Split perineum:**
 (a) Child birth
 (b) Pillion rider's accident
 (C) **Faulty enema:** Glass nozzle
 (D) **Sigmoidoscopy**
 (E) **Compressed air rupture**
 (F) **Gunshot wounds**
- Path** (1) **Extraperitoneal:**
 ↓ (a) Periproctitis
 ↓ (b) Pelvic cellulitis
 (2) **Intraperitoneal.**
 (a) With no prolapse
 (b) With slight prolapse
 (c) With complete prolapse } of intestines
 (3) **Association with trauma to other viscera:**
 (a) Bladder
 (b) Intestines
- Clinic** (1) History
 (2) Lower abdominal tenderness
 (3) Local examination
- Compl** (1) Periproctitis → pelvic cellulitis
 (2) Peritonitis
 (3) Internal fistula
 (a) Recto vesical
 (b) Fecal cystitis
- Treat** (A) **Rectal exploration:**
 (a) Speculum and finger or probe
 ↓ (b) Cutting the sphincter upto coccyx
 + (c) Free incisions and drainage
 (B) **Exploratory laparotomy**
 Ind (a) Penetration of more than 6"
 (b) Slightest abdominal tenderness
 Tech (1) Exploration
 ↓ (2) Suture
 ↓ (3) Drainage
 ↓ (4) Temporary infrapubic colostomy
 or (4) Rectal tube
 (C) **Suprapubic cystostomy:**
 Ind Test into the bladder
 Tech (a) Suprapubic cystotomy
 ↓ (b) Trans vesical suture of the rent
 ↓ (c) Cystostomy
 + (d) Rectal tube

(2) FOREIGN BODIES RECTUM

- Etio. (a) Lunatics
 (b) Sexual perversis
 (c) Treatment of prolapse
 Treat (1) Rectal extraction (Plaster of Paris method)
 (2) Laparotomy → bimanual extraction

(III) RECTAL INFLAMMATIONS: Proctitis

(1) CATARRHAL

- Etio (A) **Primary** • Local causes
 Faecal impaction, hæmorrhoids
 (B) **Secondary**: Neighbouring causes
 (a) Pelvic appendicitis
 (b) **Pelvic abscess**

- Clinical types (1) Acute
 (2) Chronic
 Clinic (a) Rectal tenesmus
 (b) Mucopus per anum
 (c) Reflex uro genital symptoms

(2) DIFFUSE SEPTIC AND GANGRENOUS PROCTITIS

- Etio (1) Trauma
 (2) Post operative acute infections anaerobic
 (3) Rectal prolapse with strangulation

Path Diffuse gangrenous rectum and perirectum

- Treat (1) Wide incisions and drainage
 (2) Hydrogen peroxide
 (3) Mag sulph-glycerine packs
 (4) Anti-gas gangrene serum

(3) SPECIFIC PROCTITIS

(A) Gonorrheal microscopic exam of discharges

(B) Chancroid

- (a) Women
 (b) Infection from vulva
 (c) Peri-anal skin
 (d) Microscopic exam

(C) Diphtheritic

- (a) Membrane formation
 (b) Microscopic exam

(D) **Dysenteric**. (1) Examine the stools
 (2) Proctoscopy

(E) **Tuberculous** •

- Etio (a) Secondary to phthisis
 (b) Primary

- Varieties (1) Tuberculosis cutis and hypertrophic
 (2) T.B. ulcers of rectum and anal canal
 (3) Diffuse T.B. ulceration of rectum

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 (2) Proctoscopy

(E) **Tuberculous**.

- Etio (a) Secondary to phthisis
 (b) Primary

- Varieties (1) Tuberculous
 (2) " "
 (3) " "

(4) **Tuberculous ischio rectal abscess :**

- (a) Idiopathic
- (b) Subacute or chronic

↓ (5) **Tuberculous fistulæ in-ano :**

- (a) Multiple
- (b) Recurrent
- (c) Phthisis present or absent

Treat (A) Secondary

Leave alone

(B) Associated

(a) Excision

+ (b) Sanatorium anti tuberculous treatment

(C) Primary

Scraping, cautery or excision

(F) **Syphilis .**Varieties (1) **Primary :**

Indolent indurated fissure

(2) **Secondary :**

(a) Mucous patches

(b) Condylomata

(c) Multiple fissures

(3) **Tertiary : Local and diffuse**

(a) Ulcerations and stricture

(b) Fistulæ

(c) Fournier's ano rectal syphiloma

Signs (a) Wassermann or Kahn

(b) Therapeutic

(G) **Lymphogranuloma inguinale**

Path Primary in genitalia

Dense peri rectal fibrosis

No involvement of mucous membrane

Clinic (a) Long progressive history

(b) Site 3-8 cms. above the anus

(c) Infiltrating rubber like consistency

(d) Intact mucous membrane

(e) Fistulæ below the stricture

Symp (1) Blood or pus per anum

(2) Painful defecation

(3) Progressive constipation

Dag Frei's skin test

Compl (a) Stricture rectum

(b) Fistulæ in-ano

Treat (A) Local

(a) Left inguinal colostomy

↓ (b) Resection

or (c) Stripping the rectal mucosa

or (d) Preliminary colostomy

↓ (e) Treatment of fistulæ

- (B) Specific Intravenous tartar emetic
5-15 grs. in 10 ccs sterile water
At weekly intervals

(4) PARASITIC PROCTITIS

(A) Thread worms

(B) Bilharziasis (a) Papillomatosis

(b) Prolapse

(c) Multiple fistula in ano

Treat Intravenous tartar emetic therapy

(See above)

(5) TRAUMATIC

(a) Faecal impaction

(b) Abuse of enemata

(c) Foreign bodies

(6) CRYPTITIS

Etio Site (a) Between the columns of Morgagni
+ (b) Above the valves of Ball

Clinic (1) Obscure dull local pain
(2) Proctoscopy

Compl Ischio rectal abscess → fistula in ano

Clinical features Of rectal inflammations

(a) Rectal tenesmus

(b) Anal mucus

(c) Reflex genito urinary symptoms

(d) Proctoscopy

Treatment Of rectal inflammations

(A) Local

(a) Astringent and antiseptic irrigations
Condy's fluid

(b) Demulcent and soothing instillations
Olive oil

(c) Local applications
Ung gallæ cum opio

(B) Specific (a) Anti syphilitic
(b) Anti tuberculous
(c) Anti dysenteric

(IV) RECTAL ULCERS

(1) TRAUMATIC

(a) Foreign bodies

(b) Lacerations

(c) Post operative

(d) Obstetric

(2) FOLLICULAR

(3) STERCORAL

Etio Faecal impaction

Site Rectal sinuses

- Clinic Chronic diffuse ulcers
 Compl Ischio rectal abscess → fistula in ano

(4) CHRONIC DIFFUSE ULCERATION

- Etio Pyococcal
 Clinic Morning diarrhoea with mucus
 Compl (a) Intestinal obstruction
 (b) Perirectal suppuration → fistula
 (c) Distant chronic sepsis arthritis

(5) SPECIFIC

- (a) Tuberculous
 (b) Syphilitic
 (c) Dysenteric

(6) POST RADIUM

- Etio Radium in pelvis (Carcinoma Cervix)
 Time One year after radiation
 Path (A) Intrinsic (a) Proctitis
 (b) Ulceration pseudo malignant
 (B) Extrinsic (a) Periproctitis
 (b) Ulceration + induration
 Clinic (1) History of radium implantation
 (2) Slight tenesmus
 (3) Anal mucus
 (4) Pseudo-malignant ulcer at cervical level
 or (4) Perirectal induration
 Diff diag Carcinoma rectum
 Compl (a) Stricture rectum
 (b) Recto-vaginal fistula
 Treat (1) Stoppage of radium implantation
 (2) Saline wash outs
 (3) Liquid paraffin instillations
 (4) Left inguinal colostomy
 (5) Presacral sympathectomy

(7) MALIGNANT ULCER (See Carcinoma Rectum)

Clinical features Of rectal ulceration

- (a) Signs of proctitis passage of mucus
 (b) Proctoscopy

Complications Of rectal ulceration

- (1) Stricture
 (2) Perirectal suppuration
 (3) Fistula in ano

Treatment Of rectal ulceration

- (A) Conservative
 (a) Local (a) Irrigations
 (b) Instillations
 (c) Applications
 (b) Specific

(B) Operative

- (a) Curetting
- (b) Excision
- Contraind (a) Perirectal suppurations
- (β) Fistulæ or sinuses
- (c) Left inguinal colostomy
- Ind (a) Complications
- (β) Later stages

(V) RECTAL STRICTURES

Def Permanent abnormal narrowing of rectal lumen

Etiology (A) Primary

- (1) **Congenital** Any rectal abnormalities
- (2) **Post operative** Any rectal operation
- (3) **Non specific ulcerative**
 - (a) Traumatic ulcer
 - (b) Chronic diffuse ulceration
- (4) **Specific**
 - (a) Syphilis
 - (b) Dysentery
 - (c) Lymphogranuloma inguinale
- (5) **Neoplastic** Carcinoma rectum

(B) Secondary

- (1) Inflammation) of surrounding tissues
- (2) New growth)

- Sites (1) Anal margin
- (2) 2" from anal margin
- (3) Upper rectum

Varieties (A) Linear or annular

Site Anal orifice or anal canal

- Cause (a) Post traumatic
- (b) Post operative

(B) Tubular

Etiology Parous women

Site Level of peritoneal reflection

- Cause (a) Local tissue destruction
- (α) Post operative
 - (β) Ulcerative
- (b) Chronic inflammation
- (α) Syphilis
 - (β) Chronic metritis
 - (γ) Chronic pelvic cellulitis

Path (1) Diffuse mucous submucous and muscular infiltrations

↓ (2) Fibrous contraction

- (B) *Internal sphincter level stenosis*
 Gradual dilatation by (a) Finger
 (b) Bougies
- (C) *High rectal stenosis* above 3" from anus
 (a) *With intagination*,
 (α) Previous colostomy
 ↓ (β) Linear proctotomy
 (b) *Without intagination*
 Bougie dilatation
- (2) **Tubular stricture**
 (A) *Local treatment*
 (a) Gradual dilatation
 (b) Colostomy → Resection
- (B) *General treatment*
 (a) Diet and laxatives
 (b) Rectal olive oil
 (c) Rectal irrigations
- (C) *Specific treatment*
 (a) Anti-syphilitic
 (b) Lymphogranuloma

(VI) PERI-RECTAL SUPPURATIONS:

Etio (1) **Septic:**

- (a) **Primary:** (α) Trauma
 (β) Rectal suppuration
 (b) **Secondary:** (α) Appendicular abscess
 (β) Prostatic abscess

(2) **Specific:**

- (a) **Tuberculosis:** (α) Rectal
 (β) Peri rectal
 (γ) Distant
 (b) **Syphilis:** Bursting gumma
 (c) Lymphogranulomatous
 (d) Bilharzial

- Sources (1) Skin
 (2) Peri proctitis proper ischio rectal cellulitis
 (3) **Rectal**
 (4) Urethral
 (5) Prostatic
 (6) **Pelvic**
 (7) **Distant:** spine, hip

- Anatomy (1) **Subcutaneous:**
 (a) Boil
 (b) Suppurating external pile
 (2) **Submucous:**
 (a) Infected mucosal abrasion
 (b) Suppurating internal pile

(3) **Ischiorectal :**(A) **Primary :**

- (a) Skin causes - boils
- (b) Local causes - trauma
- (c) Rectal causes
 - (1) *Cryptitis*
 - (2) Inflamed piles
 - (3) Rectal ulcer
 - (4) Rectal stricture
- (d) Neighbouring causes
 - (a) Urethral abscess
 - (β) Pelvic rectal suppuration
 - (γ) Pelvic osteomyelitis

(B) **Secondary :**

T B spine or hip

(C) **Pyæmic**(4) **Pelvi rectal -**

Pelvic cellulitis → suppuration

(A) **Primary :**

- (a) Post puerperium
- (b) Urine extravasation

(B) **Secondary :**

- (a) Prostate
- (b) Parametrium
- (c) Urethra or bladder
- (d) Appendix abscess

Clinic (A) **Acute :**

- (1) Rectal tenesmus + reflex symptoms
- (2) Inability to sit - tenderness + dull pain
- (3) **Tender brawny induration**
- (4) General septic toxæmia
- (5) Local examination
 - (a) Rectal finger
 - (b) Bimanual palpation
 - (c) Proctoscopy

(B) **Chronic :**

- (1) Tender swelling
- (2) Primary tuberculous focus

(C) **Pyæmic.**

In any unexplained fever in a case of primary
septic focus, examine ischiorectal fossæ

Compl **Fistula in-ano**Treat (A) **Conservative -**

- (1) Regulate defæcation
- (2) Hot hip baths
- (3) General - sulphonamides
tin and manganese

(B) **Operative : Incision and drainage**

- (a) ± or critical incision
- ↓ (b) Excision of flaps
- ↓ (c) Breaking down septa by finger

- (d) Dilatation of levator ani opening
If any (in pelvi rectal cases)
- (e) **Never open by Hilton's method**
- (C) **Post operative :**
 - (1) Flavine, eusol or mag sulph applications
 - (2) No packs or plugs
 - (3) Hip baths anti septic or hypertonic
 - (4) Anti gas gangrene serum
If bubbles of gas

(VII) FISTULA-IN-ANO :

(I) SIMPLE FISTULA-IN-ANO

Def A suppurating track lined by granulations opening into the rectum and on the skin

Varieties : (A) *Extent*

- (1) **Complete**
- (2) **Incomplete**
 - (a) **Blind external** Cutaneous
 - (b) **Blind internal** Mucous
- (3) **Horse shoe**
Both ischio rectal fossæ .
- (4) **Watering can**
Multiple external openings

(B) *Anatomical*

- (1) **Subcutaneous**
 - (a) Blind external
 - (b) Blind internal
 - (c) Complete
- (2) **Submucous**
 - (a) Blind external
 - (b) Blind internal
 - (c) Complete
 - (d) Bilateral
- (3) **Intermuscular**
Blind internal
- (4) **Para-rectal**
 - (a) Blind internal
 - (b) Complete
 - (c) Bilateral
- (5) **Sub sphincteric**
 - (a) Blind internal
 - (b) Complete
 - (c) Bilateral horse shoe anterior
 - (d) Through the external sphincter
 - (e) Below the external sphincter

(6) **Ischio-rectal :**

- (a) Blind external
- (b) Blind internal
- (c) Complete
- (d) Bilateral : horse shoe posterior

(C) ***Etiological :***

- (1) **Congenital :** Post anal sinus
- (2) **Traumatic :** Obstetric recto-vaginal
- (3) **Septic :** (a) Cryptitis
(b) Rectal ulcerations
- (4) **Specific :** (a) Tuberculous
(b) Syphilitic
(c) Lymphogranulomatous
(d) Bilharzial
- (5) **Complicating :** (a) Stricture rectum
(b) Neighbouring abscess

(6) **Malignant**(7) **Peri-rectal suppurations :**

- (a) Peri anal → Subcutaneous
- (b) Ischio rectal → Ischio rectal
- (c) Pelvi rectal → Para rectal
- (d) Peri rectal → Internal compound
- (e) Submucous → Submucous

Pathology (a) Appearance of initial septic focus

↓ (b) Septic lymphangitis or phlebitis

↓ (c) Suppuration abscess

↓ (d) Evacuation of pus

(α) One way incomplete fistula

(1) External

(2) Internal

(β) Both ways complete fistula

Morb anat (1) **External opening.**

Size, position, number, character

(2) **Internal opening :**

(a) 3" above anus para rectal

(b) Just above Hilton submucous

(c) At valves of Morgagni subsphincteric

(d) Posterior midline between sphincters.

(α) Ischio-rectal

(β) Horse shoe

(c) Anywhere between sphincters.

Intermuscular

(3) **Main track :**

Straight, curved, tortuous branched

(4) **Offshoots :** Along lymphatic areas

- Clinic**
- (1) One or more openings
 - (a) Lined by granulations
 - (b) Discharging
 - (1) Pus
 - (2) Serum
 - (3) Gases
 - (4) Fæces
 - (2) History of previous peri rectal inflammations
 - (3) Occasional acute inflammatory exacerbations
 - (4) Bimanual palpation induration
 - (5) Proctoscopy Internal orifice
 - (a) Discoloration
 - (b) Puckering
 - (c) Induration
 - (d) Methylene blue test
 - (6) Presence of etiology
 - (a) Local rectal
 - (b) Regional bone
 - (c) Distant spine or hip
 - (d) Systemic syphilis I B etc
- Compl**
- (1) Exacerbation of suppuration
 - ↓ (2) Multiplication of orifices
 - ↓ (3) Malignancy
- Treat**
- (1) Treat the etiology
 - (2) Rectal pre operative hygiene
 - (3) Operation
 - (A) Lay open the tracks
 - (B) Excision of the whole track
 - (a) Blind external
 - (a) Lay open and scrape
 - or (β) Turn it into complete and excise
 - (b) Blind internal
 - Turn it into complete and excise
 - (c) Complete sub or inter muscular
 - Excise the whole track
 - (d) Supra muscular
 - (a) Lay open and excise the sub muscular part
 - + (β) Dilate the communication and drain the supra muscular part
 - ↓ (γ) Seton for the supra muscular part
 - (e) Horse shoe
 - Open out both the ischio rectal fossæ
 - (f) Watering can
 - (a) Unite all outer orifices
 - ↓ (β) Lay open the main track
- Post treat**
- (1) Remove the pack on 5th day

(B) Complete pararectal

Opening (a) External 1.5 from anal margin
Near transverse anal line

(b) Internal Supra levator

Track Straight up 4"

Diagnosis Probe not felt throughout

(C) Bilateral pararectal

Opening (1) Internal

(a) Primary supra levator

(b) Secondary Posterior midline
Between sphincters

(2) External

(a) Primary symmetrical
1.5 from anus

(b) Secondary

Tracks (1) Main longitudinal

(2) Bilateral supra levator

(3) Bilateral ischio-rectal

(4) Submucous

Clinic (1) Pelvic cellulitis

↓ (2) High supra levator peri rectal abscess

↓ (3) Ischio rectal abscess

↓ (4) Primary external opening

↓ (5) Secondary external openings

+ (6) Internal openings

(a) High supra levator

(b) Inter-sphincteric

Diff diag (1) Submucous fistula

(2) Ischio-rectal fistula

(3) Pelvi rectal fistula

(4) Perineal fistula

Operation (A) Early blind para rectal fistula

↓ incision into the abscess

Through the ischio-rectal fossa

With finger in the rectum

(B) Blind internal → ischio rectal fistula

(a) ↑ incision and evacuation of pus

↓ (b) Dilatation of levator aperture

(C) Complete para rectal fistula

(a) Join all ischio rectal offshoots

(b) Dilate the levator aperture

(D) Bilateral para rectal

(a) Open the tracks in both ischio rectal fossae

(b) Division of coccygeus

(5) *Subsphincteric ano-rectal fistula in-ano*

Varieties (A) Blind internal subsphincteric

Cause (a) Septic Morgagni

(b) Septic fissure

Opening At Morgagni

- Track (a) Deep to external sphincter
 (b) Between the sphincter fibres
 (B) Complete subsphincteric
- Cause (a) Septic Morgagni
 (b) Septic fissure
- Opening (1) External
 1.2a from anal margin
 (a) Anterior anterior to trans anal line
 (b) Posterior posterior to trans anal line
 (2) Internal
 (a) If anterior external opening
 Opposite to it
 (b) If posterior external opening
 Posterior midline
 Inter-sphincteric
- Track (1) Anterior to trans-anal line
 Straight
 (2) Posterior to trans anal line
 Curved
- Off-shoots Present
 (C) Bilateral subsphincteric fistula
- Synonym Anterior horse shoe
- Path Subcutaneous bilateral off shoots from the terminations of
 the main track of subsphincteric fistula
- Opening (a) External
 Outer margin of ext sphinct
 (b) Internal
 Inter sphincteric
- Track (a) Main
 Radial deep to ext. sphinct
 (b) Secondary
 Horse shoe subcutaneous
- Diff diag (1) Subcutaneous fistula in ano
 (2) Urinary fistula
- Operation (A) Anterior fistulæ
 (a) Division through and through over a probe-director
 (b) Relieving cuts
 (B) Posterior fistulæ
 As in ischio rectal fistula
- (6) *Ischio rectal fistula in ano*
- Path (a) Sepsis in the anal canal
 Posterior inter-sphincteric
 ↓ (b) Septic lymphangitis
 ↓ (c) Ischio-rectal abscess
 ↓ (d) Ischio rectal fistula
- Varieties (A) Blind external ischio rectal
 Cause Ischio-rectal cellulitis
- Opening 2" from anal margin
 On the trans anal line
- Track Curved posteriorly

- (B) **Blind internal ischio rectal**
 Cause Anal canal mucosal sepsis
 Opening Posterior midline intersphinct.
- (C) **Complete ischio rectal**
 Cause Anal sepsis
 Opening (1) External
 Multiple over ischio rectal area
 (2) Internal
 Posterior midline intersphinct
 Track Curves back
 Off shoots Present
- (D) **Bilateral ischio rectal**
 Synonym Posterior horse-shoe
 Cause Anal sepsis
 Opening (1) External
 Multiple one or both sides
 (2) Internal
 Posterior midline intersphinct
 Track Curved on both sides
 Off-shoots Present
- Diag (1) External opening
 (a) Posterior to trans anal line
 (b) 2" from anal margin
 (2) Internal opening
 Posterior midline intersphinct
 (3) Ischio rectal induration
- Operation (A) *Blind external*
 (a) Lay open the main track and off shoots
 (b) Relieving cuts
 (c) Turn into complete if necessary
 (B) *Blind internal*
 (a) Incise from outside
 (b) Treat as complete fistula
 (C) *Complete*
 (a) Lay open the curved main track
 Over repeatedly passed probe-director
 (b) Lay open the off shoots
 (c) Relieving cuts
 (D) *Bilateral*
 Two stage operation
 (a) Lay open the tracks on both sides
 ↓ (b) Lay open the main track
 + (c) Look for submucous extension

(II) COMPLICATED ANO-RECTAL FISTULA

(A) Recto-vesical fistula :

- Etio (a) Congenital
 (b) Traumatic rectal wounds

(c) Inflammatory : pelvi rectal

(d) Carcinomatous

Clinic : (1) Urine per rectum

(2) Flatus and faeces per urethra

Compl : Ascending urinary infection

Treat : (1) Colostomy + cystostomy

↓ (2) Local separation

(B) Recto-urethral fistula :

Etio : (a) Congenital

(b) Urethral sepsis

(c) Carcinomatous

Treat : (1) Treat the etiology

(2) Preliminary cystostomy

↓ (3) Plastic operation

(C) Recto-vaginal fistula :

Etio : (a) Congenital

(b) Trauma - Parturition

(c) Specific

(d) Carcinomatous

Clinic : Faeces per vaginum

Treat : (1) Preliminary colostomy

↓ (2) Plastic operation

(D) Recto-intestinal fistula :

Etio (a) Appendicular abscess

(b) Diverticulitis

(c) Tuberculous intestines

(d) Carcinoma

Treat (1) Leave it alone

(2) Plastic operation

(VIII) ANAL FISSURE :

Def : A longitudinal linear tear of the muco cutaneous lining of the anal canal

Etio (a) Cause Trauma

Faecal abrasion

(b) Sites (α) 6 o'clock

(β) 12 o'clock

Due to (1) Ano rectal angle

(2) Deficient muscular support

(3) Valves of Ball

(c) Predisposers .

(1) Non supple muc. mem.

: Due to fibrosis : (α) Inflammatory

(3) Post-operative

(2) Spasm of the sphincter ani

- (3) Chronic constipation
- (4) Specific diseases : (a) Tuberculosis
(b) Syphilis
- (5) Anal growths
- Symptoms : (1) **Excruciating and prolonged pain** :
: At the time of defæcation
- (2) Tapered and fragmented stools
- (3) Reflex genito-urinary symptoms
- Signs : (a) **Sentinel pile** : (if of some standing)
- (b) **Anal spasm**
- (c) Examination : under novocain infiltration
- Diff diag : (1) Syphilis of the rectum
- (2) Submucous fistula
- (3) Ano rectal polyp
- (4) Blind internal fistula
- Treat : (A) **Conservative** :
(a) Laxatives : liquid paraffin H S
- (b) Local (a) Rectal instillations - olive
(b) Rectal applications - percau
(r) Injections : into the sphincter
(1) Novocain : 2%
↓ (2) Proctocaine : 5-8 c.c.s.
- (B) **Operative** :
Ind (a) Failure of conservatism
(b) Sentinel pile → dorsal fistula
(c) Associated abnormalities
- Tech. (1) **Sphincter-stretching** : Recamier
(a) General anæsthesia
↓ (b) Digital stretching
- (2) **Sphincterotomy** : Boyer
: Division of external sphincter
: At the junction of middle & post third
- (3) **Pectenotomy** : Miles
(a) Anæsthesia . infiltration 1" behind anus
↓ (b) Eversion of lower anal canal
By index finger
↓ (c) Incision through anal mucosa
In right posterior quadrant
↓ (d) Division of pearl white pecten band
↓ (e) Pack the pecten wound
- (4) **Excision** : Gabriel
of (a) Fissure
+ (b) Sentinel pile
+ (c) Skin triangle.
. Twice as long as muc. mem.

- After-treat : (a) Pain : morphia or omnopon
 (b) Dressings :
 (a) External :
 : B D. and after each evacuation
 (β) Packing : removal on 4th morning
 (c) Bowels :
 (a) Purge : 4th morning
 (β) Laxative : every night

(IX) HAEMORRHOIDS:

Varieties : (1) **External Piles : Covered by skin**

(A) **Dilated anal vein :**

Etio : Straining during defæcation

Symps : Swelling and fullness

- Signs : (1) Redundant peri anal skin
 (2) Fullness round the anus
 (3) Spasmodic and thick sphincters
 (4) Ballooning of the rectum

Treat : (1) **Conservative :**

- (a) Aperients and laxatives
 (b) Local emollients

(2) **Operative :**

- (a) Complete division of pecten band
 (b) Division of external sphincter
 (c) Removal of internal pile
 (d) Removal of skin triangle
 (e) Pack

(B) **Thrombotic pile : Venous rupture**

Path : Extravasation of blood due to rupture of a
 peri-anal vein by violent straining

- Clinic . (a) History of **straining** at defæcation
 (b) Painful, tender, **peri anal swelling**
 (c) Painful defæcation

- Sequelæ . (1) Absorption
 (2) Fibrosis
 (3) Ulceration → blind external fistula
 (4) Abscess : peri-anal

Treat : (A) **Conservative :**

- (a) Bedtime aperient
 (b) Lotion : frequent applications
 R Liq plumbi subacetat . oz ½
 Spt. vini, rect. : oz 1
 Glycerine : oz ½
 Aqua rosæ . oz 10

↓ (B) **Operative :**

- (a) Incision → evacuation of clot
 (b) Excision of skin ellipse :
 ↓ Enucleation of clot with capsule
 (c) T or + incision : if inflammation

(C) Cutaneous peri-anal folds :

- Etio** (a) Chronic constipation
 ↓ (b) Skin irritation
 + (c) Skin traumatisation
 + (d) Skin inflammation
 ↓ (e) Skin hypertrophy + fibrosis

Path Hypertrophic cutaneous peri anal rugæ

- Clinic** (a) Pruritus
 (b) Inspection

- Treat** (1) Treat the constipation
 (2) Wash without soap
 (3) Clean with olive oil
 (4) Apply - { Zinc oxide ZII
 (A) - Lin camphor ZIII
 (at night) { Vaseline OZII
 (B) { Zinc oxide ZII
 (at day time) { Pulv camphor ZII
 { Pulv amyli OZII

(D) Sentinel pile :

Œdematous tag of the skin at the lower end of a fissure in ano

(2) Internal Piles : Covered by mucous membrane

Def : Dilatation, tortuosity, varicosity and hæmangioma-tous multiplication of hæmorrhoidal vessels at their terminations in anal submucosa, just above the Hilton's white line

- Etio.** (a) Primary . heredity in young people
 (b) Secondary sedentary men of 40—60

Pre disp : (1) **Primary :** Habitual constipation

- (a) Gravity
 (b) Muscular obstruction
 (c) Loose support
 (d) Straining

(2) **Secondary :** Symptomatic

- (a) **Local :** Carcinoma, stricture
 (b) **Intermediate :** Pregnancy, tumour
 (c) **Hepatic :** Cirrhosis
 (d) **Prehepatic :** Heart, lungs
 (e) **General :** High blood pressure

Pathology :

Morb anat. Each internal hæmorrhoid consists of .

- (a) Central termination of sup hæm art,
 (b) Dilated, tortuous veins
 (c) Fibrous tissue

Number . Maximum : (a) Four right
 (b) Three left

Sites: (1) **Primary hæmorrhoids:**

- (a) Right anterior: 11 o'clock
: Right anterior quadrant
- (b) Right posterior: 7 o'clock
: Right posterior quadrant
- (c) Left lateral: 3 o'clock

(2) **Secondary hæmorrhoids:**

- (a) Two with right posterior:
 - (a) Right secondary: 9 o'clock
 - (β) Posterior secondary: 6 o'clock
- (b) Two with left primary:
 - (α) Left post. second: 4 o'clock
 - (β) Left ant. second: 2 o'clock
- (c) Anterior: 12 o'clock

- Groups: (1) Right anterior primary: 11 o'clock
+ Anterior secondary: 12 o'clock
- (2) Right posterior primary: 7 o'clock
+ (a) Right secondary: 9 o'clock
+ (b) Posterior secondary: 6 o'clock
- (3) Left primary: 3 o'clock
+ (α) Left post. secondary: 4 o'clock
+ (b) Left ant. secondary: 2 o'clock

Clinical stages:

- (1) *First stage:*
: **Variable bright red hæmorrhage**
: Just before or after defæcation
- (2) *Second stage:*
 - (a) Protrusion with spontaneous reduction
 - (b) Inspection on straining
- (3) *Third stage:*
: Continuous, persistent protrusion
- (4) *Associated sign:*
: **Pecten band:**

- Clinic (a) Incomplete evacuation
(b) Small fecal masses

Path Deposit of fibrous tissue circularly disposed in the sub-mucosa of the anal canal, between anal mucous membrane and the ext. sphincter, caused by passive congestion of hæmorrhoidal vessels.

- Associated Internal hæmorrhoids
Comp. Strangulation of piles

- Diff. diag: (1) Rectal polyp
(2) Intussusception
(3) Rectal prolapse

Diagnosis	Proctoscopy	
Association	(A) Local	
	(1) Proctitis	
	(2) Stricture rectum	
	(3) Fistula in ano	
	(4) Fissure in ano	
	(5) Rectal growth	
	(B) Distant	
	(a) Primary cases	
	(1) Varicocele	
	(2) Saphenous varicosities	
	(b) Secondary cases	
	(1) High growth	
	(2) Pregnancy	
	(3) Cirrhosis liver	
	(4) Hypertrophied heart	
	(5) High blood pressure	
Compl	(a) Excessive hæmorrhage → secondary hæmorrhoids	
	Painless bright red unmixed	
	(b) Prolapse intermittent → continuous	
	(α) Acute strangulation	
	(β) Chronic internal external pile	
	(c) Thrombosis painful tender swelling	
	(d) Inflammation → fibrosis or ulceration	
	(e) Infection → abscess → fistula in ano	
	(f) Strangulation → sloughing	
	(g) Portal pyæmia rigors + tender liver	
	(h) Pruritus ani	
Treat	(A) <i>Conservative</i>	
	Ind (a) Early cases	
	(b) Secondary piles	
	Tech (1) Laxatives	
	(2) Local emollients	
	(3) Hot hip baths	
	(4) Treatment of etiology	
	(B) <i>Injection treatment</i>	
	Ind (1) Uncomplicated internal piles	
	(2) Marked bleeding	
Contraind	(1) General	
	(a) Cardiac disease	
	(b) Renal disease	
	(c) Hepatic disease	
	(2) Local	
	(a) Fissure-in ano	
	(b) Fistula in ano	
	(c) Prolapsed pile or rectum	

- (d) Weak external sphincter
- (e) Carcinoma rectum
- (f) Inflamed thrombosed or fibrosed pile

- Advant*
- (1) **Ambulatory**
 - (2) Anæsthesia not needed
 - (3) Immediate relief
 - (4) Fewer complications

Disadvant Danger of complications if technique is faulty

- Solutions*
- (1) **5% carbolic acid in almond oil**
 - (a) 5 gms of pure carbolic crystals
Melted in water bath
 - + (b) 95 c cs of pure almond oil
Boiled in water bath for 30 min
Add the carbolic acid to the almond oil,
when cool and shake
 - or (2) 20% carbolic acid
In equal parts of glycerine and water
 - or (3) **5% Quinine urea hydrochlor**

Syringe Record 10 c.cs.
With angular needle and bayonet catch

- Technique*
- (1) Introduction of proctoscope
 - (2) Rectal wash out
 - (3) **Submucous injections**
 - (a) Aspirate before injection
 - (b) *Sites*
 - (a) **High** 1"-3" above ano rectal line
(i.e. at the ano rectal ring)
 - (β) **Intermediate**
Just above the pedicle of the pile
 - (γ) **Low** In the substance of the pile
 - (c) *Quantity* 5 min to 10 c.cs.
Enough to cause pale swelling with striation
 - (a) **High** 3-10 c.cs.
10% sol in almond oil
 - (β) **Intermediate** 2-3 c cs
15% sol in almond oil
 - (γ) **Low** 3-7 min
20% sol in glycerine
 - (d) *Sittings*
Four sittings at weekly intervals
 - (a) One quadrant at each sitting
 - or (β) Two piles at each sitting

After treat Tablespoon of liquid paraffin B D

- Compl.* (1) Painful thrombosis
 Injection into vein
 (2) Painful ulcer
 Injection into muc mem
 (3) Periproctitis
 Injection into perirectal tissues
 (4) Fissure in ano
 (5) Failure

(C) *Operative treatment*

- Ind* (1) Primary piles
 (2) Uncontrollable recurrent bleeding
 (3) Uncontrollable protrusion
 (4) Associated local conditions
 (5) Absence of inflammation
- Contraind* (1) Secondary piles
 (2) Inflamed piles
 (3) Early stages
- Pre-oper* (a) Light diet and restricted smoking
 (b) Purge calomel \rightarrow saline
 (c) Mist bismuth Co T D S
 (d) Colon washes
 (a) Previous morning
 (b) Previous evening
 (c) Same morning 3 hours before
 (e) Picric acid preparation of perineum
 (f) Anaesthesia low spinal or local
- Operations* (1) **Ligature of piles: Salmon**
 (2) **Ligature and excision: Milligan**
 (3) **Clamp \rightarrow excision \rightarrow suture**
 (4) **Clamp \rightarrow cautery**
 (5) **Whitehead's operation**
- Tech* Removal of whole pile bearing area
- Compl.* (a) Sensory incontinence
 (b) Stricture
- Tech* (1) **Salmon's ligature operation**
 (a) Incision of pecten band
 (b) Kocher's forceps at primary piles
 (c) Application of haemorrhoidal forceps
 (d) Dissection and ligature of piles
 (e) Return of strangulated piles in rectum
 (2) **Milligan's ligature operation (Med Ann 1939)**
 (a) Catching the pedicle and delivery of three primary piles
 (b) Dissection of ∇ shaped skin over external haemorrhoidal plexus
 (c) Exposure of circular band of subcutaneous ext. sphincter

- (d) Exposure of longitudinal muscle at the inner border of (c)
- (e) *Silk ligature around the pedicle*
 - (α) Above the pedicle forceps
 - (β) Including longitudinal muscle
- (f) Excision of the pile distal to ligature
- (g) Leave intact at least $\frac{1}{4}$ of anal muc. mem and skin between each pile

- Advantages
- (1) No recurrence
 - (2) No retraction of pedicle
 - (3) No skin tags no fissure

After treat (A) **Rectal tube method**
(B) **No rectal tube method**

(a) Hypodermic morphia

+ (b) Opium mixture

Liq ammon acetat	m. xxx
Tr catechu	m. xx
Tr opii	m. x
Tr cardamomi Co	z. i
Spt. chloroformi	m. x
Aqua cinnamomi	ad oz. i

- (1) Every 4 hours on first day
- (2) Every 6 hours on second day
- (3) Every 8 hours on third day
- (4) Every 8 hours on fourth day

↓ (c) Saline purge on 5th morning

↓ (d) Liquid paraffin every night

(e) Micturition

- (α) Restrict fluids for 24 hours
- (β) Do not try for first 24 hours
- (γ) Erect posture

(f) Diet (α) Fluids for first 4 days
(β) Ordinary from fifth day

(g) Dressings

External dressings changed

(α) B. D.

+ (β) After every defæcation

(h) *Digitalis* of the rectum

From 12th to 20th day

- Post. compl (1) **Hæmorrhage** Reactionary or secondary
- (a) External: on the dressings
 - (b) Internal
 - (α) Urgent desire to defæcate
 - (β) Rising pulse
 - (2) **Retention of urine**
 - (3) **Chronic non healing ulcers**
 - (4) **Sepsis**
 - (a) Local abscess
 - (b) Regional fistulæ
 - (c) Ascending portal pyæmia

- (5) **Stricture** Rectum or anus
- ↓ (6) Fissure in ano
- (7) Incontinence
 - (a) Sensory in Whitehead
 - (b) Traumatic injury to sphincters
- (8) **Recurrence** Development of new piles

Treatment of prolapsed and strangulated piles

(A) **Conservative**

- (a) Morphia + hot bath + Trendelenburg
- (b) Local dressing normal saline + adrenalin
- (c) Oral liq paraffin + rectal glycerine

(B) **Sphincter relaxation**

Aseptic deep intra sphincteric injection of 10 c cs. of proctocaine

(C) **Sphincter stretching + reduction of pile**

- Ind Recent prolapse
- Tech (a) Anaesthesia
- (b) Stretching of the sphincter
 - (c) Return the prolapsed pile
 - (d) Strapping of the buttocks

Treatment of thrombotic pile

Incision and evacuation of clot

(X) PROLAPSE OF THE RECTUM

Def Protrusion through the anal orifice of parts normally situated within

Etio (1) **Relaxation of peri rectal support**

Debility convalescence

(2) **Relaxation of sphincters**

(a) Prolapsed piles

(b) Operative trauma

(3) Mobile extra loop of colon congenital

(4) **Straining**

Constipation diarrhoea

Varieties (A) Age (a) Juvenile procidentia

(b) Senile

(B) Extent (a) Partial rectal prolapse

Syn Prolapsus mucosae recti

Varieties (a) Unilateral

(b) Bilateral

(b) Complete rectal prolapse

(c) Colon prolapse

Prolapse of colon through anus

Congenital mobile colon

Morb anat (1) Double tube (with central lumen)

Continuous with anal skin

(except in colon prolapse)

= (2) Sometimes peritoneal pouch

- Clinic** (1) Perianal dampness
 (2) Anal incontinence
 (3) **Anal protrusion:**
 (a) Partial 2" of muc mem alone
 (b) Complete cylindrical mucosal mass with a central lumen, projecting through the patulous anus
 (A) Continuous with anal skin
 In partial cases
 (B) Finger going between in
 (a) Complete rectal prolapse
 (b) Colon prolapse
- Diff diag** (1) Prolapsed polypus or growth
 (2) Prolapsed pile
 (3) Intussusception
- Compl** (a) Irreducibility
 (b) Inflammation
 (c) Ulceration
 (d) Strangulation
 (e) Gangrene
 (f) Periproctitis cellulitis fistulae
 (g) Incontinence
 (h) Hernia in ant peritoneal pouch
- Treat** (1) *Conservative treatment*
 (a) Reduction of protruded bowel
 (b) Prevention of recurrence
 (1) Laxatives
 (2) Regulated diet
 (3) Rectal olive oil
 (4) Rest in recumbency
 (5) Recumbent defaecation
 (6) Strapping of the buttocks
 or (7) Anal purse string around a tube
 (c) Toning the sphincter
 (1) Exercise
 (2) Strychnine
 (d) Fattening of the patient
 Codliver oil
- (2) *Injection treatment*
- Ind** (1) Incomplete prolapse
 (2) No regional infection
 (3) Etiology treated
- Tech** Gaume (Med Ann 1940)
 Submucous and muscular injections of 5% quinine and urea hydrochlor
 (a) 2-3 minims at each puncture
 (b) Circular rows
 (c) From apex to base

- Solutions (1) 5% quinine and urea hydrochlor
(2) 5% carbolic acid in almond oil

(3) *Operative treatment.*

(A) *Incomplete rectal prolapse*

- (1) **Linear cauterisation**
- (2) **Ligature of redundant mucosa**
- (3) **V excision of muc mem.**
- (4) **Whitehead's excision of muc ring**

(B) *Complete rectal prolapse*

(1) **Rectopexy:**

Ind Complete rectal prolapse

Tech (A) Marchant

(a) Incision

Middle of internatal cleft to post anal margin

(b) Separation of coccygeus muscle

(c) Suture of rectal muscularis to sacro spinous ligament

(d) Suture of coccygeus

(e) Closure with drainage

(B) Lockhart Mummery

(a) Incision

Transverse 2"

Midway between coccyx and anus

(b) Division of ext sphincter and ano-coccygeal ligament

(c) Stripping off of the rectum on three sides

(d) Pack pelvis rectal space with gauze

(e) Allow to heal by granulations

() **Colopexy:**

Ind (a) Mobile colon loop

(b) Mobile rectum

Tech (a) Incision left paramedian subumbilical

(1) Draw up the colon

(c) Peritoneal incision

On the outer aspect of pelvic colon

(d) Suture of (a) External tensor coli to (3) Iliac fascia

(e) Suture of peritoneal edges to the colon on both sides of suture (d)

(f) Closure of the abdomen

(3) **Recto sigmoidectomy: Miles**

Tech (a) Spinal anaesthesia

(b) Position lithotomy with Trendelenburg

(c) Steps

(1) Separation of mucosa from muscularis and its transverse cutting 5" from Hilton's line

- (2) Longitudinal opening of anterior peritoneal pouch and reduction of its contents
- (3) Transverse division of rectum at (1)
- (4) Ligature of the pelvic mesocolon of the prolapsed part
- (5) Transverse division of the prolapsed colon
- (6) Suture of cut rectum to cut colon.
Muscle to muscle
Mucosa to mucosa
- (7) Rectal tube
- (C) *Weak sphincter*
 - (1) Sphincter plication and suture
 - (2) Submucous paraffin injection
 - (3) Perianal subcutaneous silver wire

After treat. Prevent the recurrence of prolapse :

- (1) Avoidance of straining (defaecation)
- (2) Avoidance of gravity (sitting posture)

XI) NEOPLASMS OF THE RECTUM AND ANUS:

(A) BENIGN

- (1) Adenoma: Polypus
- (2) Papuloma: (a) Single
(b) Multiple
(c) Bilharzial
- (3) Angioma
- (4) Fibroma thrombosed pile
- (5) Lipoma
- (6) Endometrioma

Clinic (a) Cyclic rectal bleeding
(b) Submucous induration
(c) Biopsy

Diff diag Carcinoma

Treat X Ray sterilisation

(B) MALIGNANT

- (1) Carcinoma: (a) Columnar rectal
(b) Squamous anal
- (2) Sarcoma: (a) Round celled
(b) Spindle celled
(c) Lympho
- (3) Melanoma: (a) Anus
(b) Rectum

(1) ADENOMA

Etio (a) Juvenile
(b) Adult

- (1) Primary
- (2) Secondary adenomatosis
 - (a) Single
 - (b) Multiple adenomatosis
- Path Origin in mucosal glands
 - (a) Sessile
 - (b) Pedunculated
- Clinic Painless hæmorrhage with mucoid discharge
- Comp (1) Prolapse
 - (2) Torsion
 - (3) Malignancy
- Treat Excision
- (2) PAPILLOMA
 - (A) Rectal Mucoid anal discharge
 - (B) Anal Secondary to rectal discharge
- (3) ANO-RECTAL CARCINOMA
 - Etio Age 40-60
 - Sites (1) Recto sigmoid
 - Beyond the reach of the anal finger
 - (2) Ampullary
 - (3) Anal canal
 - (4) Anus
 - } felt P R
 - Pre disposers (a) Chronic ulcers
 - (b) Adenomata
 - (c) Diverticulitis
 - Pathology (A) Columnar celled Rectal
 - Irregular proliferation of Lieberkuhn's gland
 - (P) Squamous celled Anal
 - Spread (1) Direct extension
 - (a) Marginal and surface
 - ↓ (b) Rectal wall
 - ↓ (c) Peri rectal tissues
 - ↓ (d) Adjacent viscera
 - ↓ (e) Pelvic wall
 - + (f) Peritoneum
 - (2) Lymph spread
 - (a) Intra mural lymphatics
 - ↓ (b) " " " "
 - ↓ (c) " " " "
 - (1) Perianal skin
 - (2) External sphincter
 - (3) Ischio-rectal fossa
 - (b) Lateral Along mid hæm art
 - (1) Levator ani
 - (2) Pelvic peritoneum

- (3) Uro genital organs with adnexa
- (4) Internal iliac glands
- (r) **Upward: Along sup hæm. art.**
 - (1) Retro rectal glands
 - (2) **Pelvic mesocolon**
 - (3) Paracolic glands
 - (4) Inferior mesenteric glands
 - (5) Pre aortic glands
- (6) Inguinal glands: in anal carcinoma

(3) **Blood stream: Right lobe of the liver**

Classification:

- (1) **Papilliferous carcinoma:**
: Cauliflower growth
 Site: Ampulla and anal canal
 Morb. anat: Papilloma with infiltrated base
 Path: Local malignancy
 Clinic: **Early obstruction**
- (2) **Adenoid carcinoma:**
: Malignant ulcer
 Site: Ampulla and anal canal
 Morb. anat: (a) Flat transverse sessile tumour
 ↓ (b) Malignant ulcer
 Path: Early extra-mural spread
 Clinic: (a) **Proctitis**
 ↓ (b) Late obstruction
- (3) **Colloid or mucoïd carcinoma:**
 Site: Ampulla and anal canal
 Morb. anat. Colloid or mucoid degeneration
 Path: **Extremely malignant**
- (4) **Melanotic carcinoma:**
 Site: Ampulla and anal canal
 . Posterior wall
 Morb. anat. Adenoid carcinoma with pigmentation
 Path. Early malignant
 : Early widespread metastases
 . Recurrent

Clinical groups

- (A) **Recto-sigmoid carcinoma: 63%**
 - (1) *Papilliferous Stenosis syndrome*
 - (a) Diarrhoea with mucus and blood
 - ↓ (b) Intestinal obstruction
 - (2) *Adenoid: Stenosis syndrome*
. Acute on-chronic intestinal obstruction
- (B) **Ampullary carcinoma: 30%**
 - (a) *Pre-ulcerative stage: Latent*
 - (1) Symptomless
 - (2) Sensation of foreign body

- (3) Constipation \leftrightarrow diarrhoea
 - (4) Diarrhoea
 - (b) *Ulcerative Stage Dysenteric syndrome*
 - (1) Proctitis
 - (a) Frequency
 - + (p) Blood + offensive mucus
 - (2) Progressive cachexia
 - (c) *Peri rectal infiltration . Periproctitis*
 - (1) Frequency + (blood + pus + mucus)
 - ↓ (2) Perirectal suppuration
 - ↓ (3) Fistulæ in ano
 - + (4) Cachexia
 - (d) *Implication of neighbours :*
 - Sciatica syndrome*
 - (1) Intestines intestinal obstruction
 - (2) Nerves **Sciatica**
 - Obturator neuralgia
 - Sacralgia
 - (3) Veins **Hæmorrhoids**
 - (4) Viscera uterus prostate bladder
 - (e) *General secondary carcinomatosis*
 - Distant syndrome*
 - (1) Enlarged liver with jaundice
 - (2) Ascitis
 - (3) Oedema of lower limbs
 - (4) Bony foci
- (C) **Anal canal carcinoma • 7%**
- (1) *Sensation of foreign body*
 - (2) **Pain with discharge**
 - (3) **Hæmorrhoids**
- Signs (1) **Digital exploration :**
- (a) Site
 - (a) Recto sigmoid
 - Beyond reach
 - (β) Ampullary } within reach
 - (γ) Anal canal }
 - (b) *Nature of the growth*
 - (a) Proliferative
 - (β) Ulcerative
 - (γ) Fibrotic
 - (c) *Consistency*
 - (d) *Fixability*
 - (e) *Mobility*
 - (a) Muc mem over the focus
 - (β) Focus over peri rectal tissues
 - (f) *Implication of neighbours*
 - (a) Anterior genito urinary
 - (β) Lateral pelvic wall
 - (γ) Posterior sacrum

- (g) Secondaries *
 - (a) Glands
 - (β) Recto vesical pouch
- (2) **Procto-sigmoidoscopy :**
 - (a) Stricture
 - (b) Ulcer
 - (c) Tumour
- (3) **Biopsy :**
 - (a) **Broder :** Cell differentiation grades
 - (b) **Duke :** Spread depth grades

Clinical syndrome

- (1) **Obstructive :** *Senile large gut obstruction*
 - (a) Constipation alternating with diarrhoea
 - ↓ (b) Acute on chronic intestinal obstruction
- (2) **Inflammatory :** *Pseudo dysentery*
 - Tenesmus + (blood + mucus)
- (3) **Tumour :** *Pseudo papillomatosis*
 - (a) Anal cauliflower growth
 - + (b) Incontinence + (blood + mucus)
- (4) **Hæmorrhoids :** *Internal piles*
 - Internal piles in elderly subjects
- (5) **Peri proctitis :** *Fistulæ in-ano*
 - Multiple fistulæ in ano in seniles
- (6) **Pressure or implication :** (A) *Neuralgias*
 - (a) Sciatica
 - (b) Sacralgia
 - (c) Recto vesical fistula
- (7) **Distant :**
 - (a) Liver enlargement
 - (b) Ascitis
- (8) **Latent :**
 - Unexplained cachexia

- Diff diag
- (1) **Local conditions :**
 - (a) Proctitis
 - (b) Ano rectal ulcers
 - (c) Ano rectal strictures
 - (d) Ano-rectal specific diseases
 - (e) Ano rectal growths
 - (f) Hæmorrhoids
 - (2) **Abdominal conditions :**
 - (a) Intestinal obstruction
 - (b) Ascitis
 - (c) Liver enlargement
 - (3) **General conditions :**
 - (a) Metabolic diseases
 - (b) Anæmias

(1) *Operations for carcinoma rectum*

- (1) Local excision
- (2) Conservative resection
With preservation of sphincters
- (3) **Lockhart Mummery** : St Mark Hospital
 - (a) Preliminary inguinal colostomy
 - ↓ (b) **Perineal excision**
- (4) **Perineo-abdominal excision** : Grey Turner
- (5) **Abdomino perineal excision** :
 - (a) **One stage** : Ernest Miles
 - (b) **Two stage** Coffey
- (6) **Abdominal Hartmann**
 - Ind (a) Early high growth
 - (b) Upper third of rectum
 - (c) Unfit for combined operation
- (7) **Abdomino anal 'Pull through'** of Goetze
 - Ind Low, freely movable growth

Pre oper treat

- (1) **Intestinal preparation**
 - (a) Mag sulph 2ii
Mag carb zi
Aqua chloroform ozi
(α) Three or four doses two hourly
↓ (β) One dose a day
 - (b) Colon wash out B D
 - (c) Mist bismuth cum opio T D S
 - (d) Dimol grs V B D
 - (e) Entero vioform
- (2) **Preliminary drainage**
 - Ind (a) Acute or chronic obstruction
 - (b) Rectal or peri rectal abscess
 - (A) **Cæcostomy**
Ind Acute intestinal obstruction
 - (B) **Left inguinal colostomy**
- (3) **General preparation**
 - (A) Blood transfusion
 - (B) Intravenous glucose saline
- (4) **Prophylaxis**
 - (a) Anti strepto
 - + (b) Anti coli
 - + (c) Anti gas gangrene} sera
- (5) **Investigations**
 - (A) Blood
 - (a) Hæmoglobin %
 - (b) Blood count
 - (c) Blood group
 - (d) Blood sugar
 - (e) Blood urea

- (B) Blood pressure Pressure ratio percentage
 Below 25% fatal
 Above 75% risky
 Near 50% best

- (C) Urine (a) 24 hour specimen
 (b) Catheter specimen
 (c) Chemical exam.
 (d) Microscopic exam
 (e) Urea concentration
 (f) Kidney efficiency tests

- (D) Heart and lungs

Anæsthesia Spinal
 Technique

- (A) Miles radical abdomino perineal operation

- (1) *Abdominal part*

- (1) Position high Trendelenburg lithotomy
 (2) Incision right paramedian subumbilical
 (3) Exploration of
 (a) Mesocolon (α) Base
 (β) Intermediate
 (γ) Colic border
 (b) Liver
 (c) Local bowel adhesions etc
 (d) Recto vesical pouch

- (2) *Pelvic part*

- Stage one* (a) Deliver the pelvic colon out
 (b) Ligature the inf mesent art
 Between (α) First and second sigmoid branches
 or (β) At the level of aortic bifurcation
- Stage two* (a) Complete division of pelvic mesocolon
 Below the ligature
 (b) Incision of the peritoneum
 On both sides of mesocolic base
 (c) Stripping of post aspect of pelvic colon and rectum
 From ant surface of sacrum
 (d) Division of peritoneum along pelvic brim
 Upto the base of bladder or vagina
- Stage three* Separation of anterior wall of the rectum
 From vesicles and bladder
 Upto prostate
- Stage four* Division of lateral ligaments of rectum
- Stage five* Division across of pelvic colon
 3" above the carcinoma
- Stage six* (a) Re-establishment of peritoneal pelvic floor
 At the level of pelvic brim
 (b) Correction of the tendency to ileal kink
 At ileo-cæcal junction
- Stage seven* (a) Left inguinal colostomy
 1.5 internal to ant sup iliac spine
 (b) Closure of the abdomen

- Post treat**
- (1) Treatment of shock
 - (2) Blood transfusion + intravenous therapy
 - (3) Nothing by mouth + oral hygiene
For 48 hours
 - (4) Dressings after 72 hours

(a) Hydrogen peroxide	}	B D
↓ (b) Mercury perchlor		
↓ (c) Normal saline		
(d) Dettol		
 - (5) Colostomy

(a) Enema	5th day
(b) Purgative	6th day
(c) Irrigations	daily from 7th day
(d) Passage of finger	daily
(e) Laxatives	every night
 - (6) Convalescence upto 18th day

- Post compl**
- (1) **Shock**
 - (2) **Acute gastric dilatation**
 - (3) **Gangrenous pelvic cellulitis**
 - (4) **Hæmorrhage**
 - (5) **Pulmonary complications**
 - (6) **Renal failure**
 - (7) **Intestinal toxæmia**
 - (8) **Decubitus**
 - (9) **Bladder dysfunction**
- Cause** Trauma to (a) Sympathetic ganglion
+ (b) Presacral nerve
- Clinic** (a) Retention
(b) Atony
- Treat** Indwelling catheter
Ind Residual urine > 50 ccs
- (10) Levator hernia

(II) Operations for anal carcinoma

- (A) (a) Colostomy
↓ (b) **Local excision**
+ (c) Bilateral excision of inguinal glands
- (B) (a) **Radium therapy** For primary
+ (b) Bilateral excision of inguinal glands

Recurrence rate after radical operation for rectal carcinoma

Depends on

- (1) Variety

(A) Papilliferous	nil
(B) Adenoid	14%
(C) Colloid	87.5%
(D) Melanotic	100%
- (2) Stage later operation higher recurrence
- (3) Operation

(A) Miles	30%
(B) Mummery	46%

(III) *Treatment of inoperable ano rectal carcinoma :*• **Palliative left inguinal colostomy :**

- Ind (a) Intestinal obstruction
 (b) Hæmorrhage
 (c) Diarrhœa
 (d) Pain
 (e) Fistulæ pelvi rectal
 ischio rectal
 internal

(A) Recto sigmoid carcinoma

Clinic Intestinal obstruction syndrome

Treat Colostomy as a preventive as early as possible

(B) Ampullary carcinoma

Clinic Pelvi rectal suppuration

Treat Early colostomy as preventive and preliminary

(C) Anal carcinoma

Clinic Painful

Treat Early colostomy as preventive measure

(IV) *Palliative treatment for ano rectal carcinoma sequelæ*(1) **Intestinal obstruction .**

- (a) Enemata and wash outs
 (b) Urgent life saving cæcostomy
 (c) Preventive left inguinal colostomy

(2) **Rectal mucoid discharge :**

- (a) Rectal injections of alum 10 grs. to 21
 (b) Linear proctotomy with absorbent dressings

(3) **Hæmorrhage .**

- (a) Local applications
 Adrenaline, Tr ferri perchlor
 + (b) General coagulant treatment
 ↓ (c) Scraping

(4) **Sacralgia :**

Morphia 1/6 gr every 8 hours
 ↓ 3 grs. every 4 hours

(5) **Pelvi rectal and ischio rectal suppuration :**

- (a) Left inguinal colostomy
 (b) Evacuation → external drainage

(6) **Recto vesical or vaginal fistulæ :**

- (a) Immediate left inguinal colostomy
 (b) Bladder and rectal irrigations

(7) **Ascitis :**

Repeated tapings or leave alone

(XII) RECTAL INCONTINENCE:Causes (A) *Sphincter affections*(1) **Congenital absence:**

Imperforate anus

(2) **Trauma:**

Post operative

(3) **Stretching:**

(a) Prolapse or intussusception

(b) Digital in anal fissure

(4) **Carcinomatous infiltration**(5) **Paralysis:**

(a) Central

(b) Spinal

(B) *Sensory loss*

Whitehead's removal of ring of anal mucosa

(C) *Fæcal accumulation in rectum*Treat (1) **Left inguinal colostomy.**

Ind (a) Absent sphincter

(b) Paralysed sphincter

(c) Infiltrated sphincter

(d) Sensory incontinence

(2) **Sphincteroplasty.**

Ind (a) Trauma to sphincter

(b) Stretched sphincter

(XIII) PRURITUS ANI:

Def Incessant itching of the anal and perianal skin

Etiol (A) **Constitutional:** Diabetes, rheumatism, gout(B) **Local** (a) Thread worms

(b) Haemorrhoids

(c) Mucoid discharge

(d) Constipation

(e) Eczema

(C) **Nervous**

Path (a) Erythema and erosions

↓ (b) Hypertrophy and lichenification

↓ (c) Lichenification erosions dermatitis

↓ (d) Extensive skin involvement

Treat (1) **Treat the etiology.**

(a) Local

(b) Constitutional

(2) **Local treatment:**(A) *Conservative*(a) **Cleansing and dry applications**

(b) Applications :

- (1) *Perceinal* 1%
- (2) *Pulv zinci oxid* *zii*
Lint camphor *ziii*
Anæsthesine *zi*
Lanoline *oz i*
Vaseline *oz i ss*
- (3) *Liq plumbi subacetatis* *zi*
Fresh milk *zvi*
- (4) *Paint* (1) *Saturated silver nitrate*
 ↓ (2) *Sod chloride* *zi to oi*
- (5) *Deck's ointment*
 Salicylic acid 4 parts
 Bismuth subnitras 10 parts
 Mercury salicylate 4 parts
 Oleum eucalypti 4 parts
 Vaseline } *aa to 100 parts*
 Lanoline }
- (6) *Whitfield's ointments*
 (α) *Acid carbolic* *grs v*
 Salicylic acid *grs xx*
 Acid benzoic *grs xx*
 Vaseline *oz i*
 (β) *Ung Picis*
 Zinc oxide *grs xi*
 Ung acid salicylas *z iv*
 Lanoline *ad oz i*

(B) Non operative**(1) Injections of sclerosing anæsthetics :**

- Sol* (a) *Nupercaine* 5 c cs
 (b) *Proctocaine*
 (c) *A B A Solution*
- Compl* (1) *Abscess*
 (2) *Sloughing*
 (3) *Incontinence*

(2) X-Ray exposures**(C) Operative****(1) Ball's operation :**

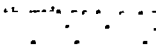
Undercutting perianal skin

(2) Excision of perianal skin .

- Ind* (a) *Perianal eczema*
 (b) *Failure of all other methods*

(XIV) IMPORTANT POINTS

- (1) **Embryology of rectum and anal canal**
 - (1) *Hind gut* upto peritoneal reflection
 - (2) *Post allantoic gut* upto anal sinuses
 - (3) *Proctodæum** anal canal below the sinuses

- (71) Sites of carcinoma rectum
 - (a) Recto sigmoid
 - (b) Ampulla
 - (c) Anal canal
 - (d) Anus
- (72) Clinical classification of carcinoma rectum
 - (a) Obstructive constipation alternating with diarrhoea
 - (b) Inflammatory Tenesmus + blood + mucus
 - (c) Formative
 - (a) Cauliflower growth
 - (β) Blood + mucus
 - (γ) Incontinence
 - (d) Haemorrhoidal Internal haemorrhoids in old
 - (e) Infiltrative
 - (a) Neuralgias
 - (β) Internal fistulae
 - (f) Distant
 - (a) Enlarged liver
 - (β) Oedematous lower limbs
 - (γ) Ascitis
 - (g) Latent Cachexia
- (73) Younger the patient, more hopeless is the prognosis in carcinoma rectum
- (74) Clinical syndrome in carcinoma rectum
 - (a) High growths obstruction
 - (b) Low growths proctitis
 - (c) Anal growths tumour
- (75) A 
to exclude carcinoma rectum
- (76) Anal canal carcinomata are usually mistaken for haemorrhoids
- (77) 'Dysentery or Haemorrhoids in elderly people should in each case suggest carcinoma rectum
- (78) Clinical stages of carcinoma rectum
 - (a) Pre ulcerative latent
 - ↓ (b) Ulcerative diarrhoea with blood and mucus
 - ↓ (c) Obstructive constipation + diarrhoea → obstruction
 - ↓ (d) Perirectal
 - (a) Perirectal suppuration
 - ↓ (β) Fistulae in ano.
 - ↓ (e) Infiltrative
 - (a) Neuralgias
 - (β) Internal fistulae
 - ↓ (f) General carcinomatosis
- (79) Intramural spread of carcinoma rectum is trivial
- (80) Upward extramural lymphatic spread is most important in carcinoma rectum involving pelvic mesocolon and mesocolic, iliac & aortic lymph glands.
- (81) Carcinoma of recto sigmoid or rectum is more malignant than carcinoma of colon.

- (82) Chief difficulties in the early diagnosis of rectal carcinoma
- (a) Insensibility of rectal mucosa
 - (b) Neglect of rectal examination
 - (c) Lack of symptoms in early stages.
- (83) In young subjects carcinoma of the rectum progresses with extreme rapidity and in patients under 30 the only hope lies in early detection
- (84) *Prominent clinical aids in the diagnosis of rectal cancer*
- (a) *Rectal bleeding*
 - (b) *Signs of proctitis*
 - (c) *Digital examination*
- (85) Main lymphatic spread in any rectal growth is in an interrupted upward direction
- (86) First lymph glands to be affected are peri rectal near about the growth, next are at or near the point of ligation of sup hæm vessels in which case the prognosis is bad
- (87) Indications for radium in rectal cancer
- (a) Refusal of operation
 - (b) Inoperable cases
 - (c) Recurrences
- (88) Operations for carcinoma rectum
- (A) Conservative Lockhart Mummery
 - (a) Preliminary colostomy
 - ↓ (b) Perineal excision
 - Ind (1) Growth
 - (α) Small
 - (β) Touchable
 - (γ) Freely movable
 - (2) General condition not too good
 - (B) Combined abdomino perineal
 - (1) One stage Miles
 - (2) Two stage Coffey
 - Ind (1) Growth
 - (α) Big
 - (β) Untouchable
 - (γ) Peri rectal infiltration
 - (2) General condition good
 - (C) Palliative left inguinal colostomy
 - Ind Inoperable growth
- (89) The first stage in all operations for carcinoma rectum must be
 - (a) Exploratory laparotomy
 - + (b) Preliminary drainage
 - (α) Deliberate left inguinal colostomy
 - (β) Urgent cæcostomy
- (90) Complete removal of mesocolon with a strip of peritoneum on either side is essential to prevent recurrence in carcinoma rectum.

- (91) *Take care of the following in excision of the rectum*
 (a) Ureters
 (b) Urethra
 (c) Point of ligature of sup hæm art
- (92) In all operations for excision of the rectum, tie in a catheter in the bladder before operation is started
- (93) Anal purse string is a very good preliminary step in excision of the rectum
- (94) The prognosis of operation for radical removal of rectal carcinoma is in direct proportion to the stage of the disease at the time of the operation
- (95) *Temporary urgent cæcostomy is a life saving procedure in most cases of colon resections and all cases of acute intestinal obstructions*
- (96) *Intravenous saline should be given until*
 $\text{Urine} + \text{Ag No}_3 = \text{Heavy white precipitate}$
- (97) Whether the primary squamous celled anal carcinoma is treated by radium or surgery, the glands in the groin should be removed by operation.
- (98) Miles radical abdomino perineal operation
 (A) Abdominal part
 Rapid survey
 (B) Pelvic part
 (a) Ligature of inf mesent art
 (b) Division of mesocolon + peritoneal incisions
 (c) Separation of pelvic colon and rectum
 (α) Posterior
 (β) Lateral
 (γ) Anterior
 (d) Division of pelvic colon
 (e) Re-establishment of pelvic floor
 (f) Left inguinal colostomy
 (g) Closure abdomen
 (C) Perineal part
 (a) Anal purse-string
 (b) Incision —o
 (c) Removal of coccyx
 (d) Exposure of presacral cavity
 (e) Division of coccygeus and levator origins
 (f) Isolation of rectum and anal canal
 (g) Removal of the whole excised mass
 (h) Gauze pack
- (99) Important points in excision of carcinoma rectum
 (a) Ligature between first and second sigmoid branches
 (b) Save (α) Ureters
 (β) Urethra

- (c) Purse string the anus
- (d) Remove whole of the mesocolon and enough peritoneum
- (100) *Do not forget to palpate liver before starting excision of the carcinoma rectum*
- (101) *When a case of carcinoma rectum in whatever position it may occur, is considered to be inoperable, the sooner the colostomy is performed, better it is for the patient*
- (102) *Chief signs and symptoms of rectal lesions*
 - (a) *Imperforate anus*
Acute intestinal obstruction within 3 days of birth
 - (b) *Perirectal suppuration*
Perirectal tender induration
 - (c) *Fistula in ano*
Perirectal external openings
 - (d) *Rectal prolapse*
Cylindrical red mass with central lumen
 - (e) *Fissure in ano*
Pain + spasm
 - (f) *Internal hæmorrhoids*
Painless, variable, bright red bleeding
 - (g) *Carcinoma rectum*
 - (1) *Obstructive intestinal obstruction*
 - (2) *Proctitis pseudo-dysentery*
 - (3) *Internal piles piles in seniles*
 - (4) *Tumour anal fungation*
 - (5) *Referred sciatica*
 - (6) *Distant enlarged liver*
 - (7) *Latent anæmia, debility*
- (103) *Common post operative sequelæ in ano rectal operations*
 - (a) *Stricture*
 - (b) *Fissure*
 - (c) *Incontinence*
 - (d) *Prolapse*
- (104) *Stricture rectum most common causes*
 - (a) *Syphilis*
 - (b) *Carcinoma*
 - (c) *Post-operative*
- (105) *Hot hip-bath is very useful in rectal and perirectal inflammations*
- (106) *Chief complication of fistula in ano excision is recurrence, the chief causes of which are*
 - (a) *Incomplete operation*
 - (b) *Tuberculosis.*
- (107) *Chief question in internal hæmorrhoids from diagnosis and treatment points of view is*
Are they primary or secondary?

- (108) If anæmia from bleeding piles is severe
 (a) Inject the piles
 or (b) Blood transfusion
 ↓ Operation
- (109) If in injection treatment for acutely bleeding pile it is not possible to find out which pile is at fault ask the patient the direction of the blood squirt if any. The offending pile is to the opposite side of the direction of the squirt. (If the squirt is from right to left, the pile is on the right, and *vice versa*)
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CHAPTER VIII

HERNIA

Def Entrance of the contents of a cavity, into its prolongation formed by

- (a) **Non-obliteration** of a congenital process of its wall congenital hernia
or (b) **Insinuation** of its wall through a weak site in the parietes (α) Congenital inguinal canal
(β) Acquired ventral hernia

- Pro** (1) Age (a) Infants
(b) Adolescents
(c) Seniles
(2) Sex (a) Males inguinal
(b) Females femoral
(even in females inguinal hernia is more common than femoral)
(3) Occupation laborious
(4) Predisposers
(A) **Weak spot** in abdominal parietes
(a) **Congenital** • Maldeveloped muscle
(b) **Acquired** • (α) Scars
(β) Stretching
(γ) Paralysis
(B) **Increased intra abdominal pressure** •
(a) **Intermittent** .
(1) Laborious occupations
(2) Chronic cough
(3) Constipation
(4) Dysuria
(5) Pregnancy etc
(b) **Sudden** :
Severe muscular effort
Strangulation at first appearance
(C) **Hernial sac** :
(a) **Congenital** : Preformed
(b) **Acquired** :
(α) Distension diverticula
(β) Traction diverticula
(γ) Sliding hernia

- Path anat** (1) **Sac** : Peritoneal diverticulum
(a) **Neck** Communication between sac and peritoneal cavity

- (b) Body
 - (c) Fundus
 - (2) **Coverings: Layers of abdominal parietes**
 - (a) Extra peritoneal tissues
 - (b) Fascia transversalis
 - (c) Abdominal muscle layers
 - (d) Subcutaneous tissues
 - (e) Skin
 - (3) **Contents: Any abdominal viscus except liver**
- Clinics: (A) **Hernia:**
: Globular swelling at a hernial orifice:
 With: (a) OWN
 (b) (β) Manipulative
- (B) **Contents:**
- (1) Omentum
 - (a) Doughy feel
 - (b) Lobulated and spongy
 - (c) Dull note
 - (d) Reduction *en masse*
 - (2) Bowels:
 - (a) Elastic feel
 - (b) **Visible peristalsis**
 - (c) **Resonant note**
 - (d) Gradual reduction
 - (e) **Gurgling**
 - (3) Colon:
 - (a) Big size
 - (b) Incarceration
 - (c) Viscero ptosis
 - (4) Bladder:
 - (a) Urinary trouble
 - (b) **Change in size on catheterisation**
- Varieties: (α) Para peritoneal.
 : In direct inguinal
 (β) Intra-peritoneal
 (γ) Extra peritoneal latent
 . Lipoma adherent to medial
 aspect of the neck of the sac
- (5) Appendix:
 - (a) Hernia with appendix attack
 - (b) Tender McBurney
 - (c) Palpation
 - (6) Meckel's diverticulum: Littre's hernia
 - (7) Ovary:
 - (a) Abnormal menstruation
 - (b) Ovarian sensation on pressure
 - (c) P. V.

- (8) Testis abnormal or normal descent
 - (a) Absence in scrotum or masking by hernial contents
 - (b) Testicular sensation on pressure
- (9) Fluid signs of fluid
- Causes
 - (a) Hydrocele of hernial sac
 - (β) Communicating ascitis
- (10) Loose bodies

Diff diag (See under respective Hernias)

Treatment

(1) Truss treatment of hernia

- Ind
 - (a) Infants or seniles
 - (b) Refused or contraindicated operation
- (A) *Truss should be ordered*
 - (1) As a possible method of cure in
 - (a) Inguinal } hernias of infants within first year
 - (b) Umbilical }
 - (2) As a prevention of progression and strangulation
 - (a) Inguinal hernia
 - (α) Upto 4 years of age
 - (β) Adults where operation is postponed
 - (b) Umbilical hernia
 - Upto 2 years of age
 - (3) As a safeguard after emergency operation
 - After strangulated herniotomy
 - (4) As only a safeguard
 - Reducible hernia + contraindicated operation
- (B) *Truss should be permitted in*
 - (1) Direct inguinal hernia
 - (2) Incisional hernia
 - (3) Oblique inguinal hernia
 - With operation contraindicated
- (C) *Truss should be discouraged in*
 - Operable oblique inguinal hernia
- (D) *Truss is dangerous in*
 - (1) Femoral hernia
 - (2) Adult umbilical hernia
 - (3) Incisional hernia
 - With small neck and large sac

Regional indications of truss

- (1) Oblique inguinal : contraindicated
- (2) Direct inguinal : indicated
- (3) Femoral : contraindicated
- (4) Umbilical :
 - (a) Infantile : indicated
 - (b) Adult : contraindicated

Tech: (1) Recumbent position

↓ (2) Reduction of hernia

↓ (3) Application of the truss:

(A) Should control the hernia when:

: Patient stands with legs apart, stoops and coughs

(B) Should be worn day and night:

For at least 18 months

Particulars: *Required for preparation of truss*

(1) Site

(2) Side

(3) Size of the neck and sac

(4) Girth of the body at the level of hernia

Prognosis: Complete cure is possible only in:

(a) Inguinal } hernias of infants
(b) Umbilical }

(2) Injection treatment of hernia

Ind. Indirect, reducible inguinal hernia

Contraind. (a) Large, old-standing hernia

(b) Irreducible hernia

(c) Truss uncontrollable hernia

Fluids: (1) Mayer: Zinc sulphate 2i

Phenol crystals 2vi

Glycerine 2iv

Aqua cinnamomi ozii

Sterile distilled water ozii

(2) Gal tanol

Tech: (a) Semi Trendelenburg position

(b) Needle insertion at int. ring

(c) Injection $\frac{1}{2}$ " outside the ring

(d) Site into the cord substance

. in the neighbourhood of int. ring

. through ext. obl. aponeurosis

(e) Number 6 to 12

(f) Interval: 5 days

Post. treat. Truss day and night for 3-6 months

Post. compl. (a) Shock

(b) Reaction

(c) Peritonitis

(3) Operative treatment of hernia:

Ind: Presence of a hernia:

(1) Age. between 18 months and 65 years

(2) Occupation. active, laborious

(3) Sex: females of child-bearing age

(4) Circumstances: going out of surgical help

(5) Local condition:

(a) Progressive hernia

(b) Complicated hernia

- Contraind: (1) Age: very young and very old {
 (2) **Non-removable etiology:** (a) Cough
 (b) Constipation
 (c) Dysuria
 (3) Local: too big size
 (4) General: dangerous constitutional disease

Operations: (A) **Herniotomy:** Removal of hernial sac

- Ind: (a) Children
 (b) Small, recent, congenital hernia

(B) **Herniorrhaphy:**

- Tech: (a) Removal of hernial sac
 + (b) Repair of the region by sutures

- Ind: (1) Average hernia
 (2) Adult age

(C) **Hernioplasty:**

- Tech: (a) Removal of hernial sac
 + (b) Living fascial graft repair

- Ind: (1) Large hernia
 (2) Recurrent hernia
 (3) Weak peri-hernial structures
 (4) Ventral hernia
 (5) Direct acquired hernia
 (6) Laborious occupation
 (7) **Surety of asepsis**

Post operative complications.

(A) **Local:**

(1) **Hæmatoma:**

- Varieties: (a) Local
 (b) Regional
 (c) Gravitational scrotum

- Treat: (a) Prophylaxis of hæmorrhage
 (b) Aspiration or evacuation

(2) **Sepsis**

- (3) Cut out sutures

(B) **Abdominal:**

- (1) Paralytic ileus
 In umbilical and ventral hernias
 (2) Intestinal obstruction
 (3) Peritonitis
 (4) Fæcal fistula

(C) **Respiratory:** In umbilical hernia

- (1) Collapse of the lung
 (2) Œdema of the lungs
 (3) Infarction of the lungs
 (4) Pneumonia

(D) Urinary :

- (1) Urinary infection
- (2) Trauma to the bladder

Post operative treatment :**(1) Convalescence :**

- (a) Three weeks : in bed
- (b) Six weeks : protected life
- (c) Three months : supportive bandage
- (d) Six months : no laborious occupation

(2) Treatment of etiology :

- . Any cause of chronic strain

Post operative sequela : Recurrence, recurrent hernia :**Causes : (1) Pre-operative : Contraindicated operations**

- (a) Badly chosen cases
- (b) Etiology untreatable or untreated

(2) Operative : Faulty technique

- (a) Faulty operative procedure
- (b) Neck. (a) Too low ligature
(β) Overlooked diverticulum
- (c) Stitches. (a) Too tight
(β) Premature absorption
(γ) Rupture
- (d) Trauma. (a) Nerves
(β) Muscles

(3) Post-operative : Faulty convalescence

- (a) Sepsis
- (b) Too short convalescence
- (c) Untreated etiology

Factors : (A) Anatomical :

- (1) Poorly developed muscles
- (2) Obesity
- (3) Senile muscular degeneration

(B) Technical errors :

- (1) Sac (a) Failure of removal
(b) Overlooked diverticulum
(c) Improper closure
- (2) Suture : (a) Tension
(b) Too tight
(c) Too early absorption
- (3) Cord bulky cord
- (4) Trauma : to nerves or muscles

(C) Errors of judgement :

- (1) Improper patient
- (2) Improper type of operation
- (3) Improper convalescence

(D) Other factors :

- (1) Hæmatoma → suppuration
- (2) Injury to motor nerves
- (3) Straining
- (4) Nature of hernia :
 - (a) Direct
 - (b) Sliding
 - (c) Strangulated

Treat · Re-operation → Fascial graft hernioplasty

Tech . Expose the structures where they are normal

Difficulties: (a) Adhesions

(b) Obliteration of normal tissue planes

Complications of hernia :**(A) Irreducible hernia :**

Def . A hernia, contents of which cannot be returned into the peritoneal cavity

Causes . (a) **Contents :**

- (a) Adhesions between ·
 - (1) Contents themselves
 - (2) Contents and sac
- (β) Increase in the bulk of the contents

(b) **Neck :**

- (a) Pressure around the neck
- (β) Too narrow neck
- (γ) Adhesions round about . truss

(c) **Abdominal cavity :**

- (a) Increased intra abdominal pressure
- (β) Lack of room

Treat . (1) **Operation**

(2) Truss and taxis contraindicated

(B) Obstructed hernia :

Def Irreducible hernia with obstruction to the onward flow of intestinal contents

Clinic: (a) Irreducible hernia

+ (b) Mild intestinal obstruction

Treat: Operation

(C) Incarcerated hernia :

Def: Obstructed hernia due to faecal impaction

Clinic (1) **Hernial swelling .**

- (a) Large
- (b) Tender
- (c) Irreducible
- (d) Doughy: pitting on pressure

(2) **Intestinal obstruction :**

- (a) Visible peristalsis
- (b) Vomiting
- (c) Distension

- Treat (1) **Conservative**
 (a) Repeated liquid paraffin
 (b) Cautious bowel washes
 (2) **Operation**

(D) **Inflamed hernia**

- Def Inflammation of perihernial tissues, sac and contents with accumulation of inflammatory products
- Causes (1) **Trauma**
 (2) **Obstruction** → venous congestion
- Clinic (a) **Irreducible hernia**
 (b) **Local signs of inflammation**
- Compl (1) **Adhesions and irreducibility**
 (2) **Hydrocele of the hernial sac**
 (3) **Strangulated hernia**
- Treat (A) **Postural treatment**
 Ind (a) **Early stages**
 (b) **No hydrocele of hernial sac**
 (B) **Herniotomy with drainage of the wound**

(E) **Strangulated hernia**

- Def Hernia with acute obstruction to
 (a) **Reducibility**
 (b) **Circulation** (a) **Lymphatic**
 (β) **Venous**
 (γ) **Arterial**
 (c) **Nerve supply**
 (d) **Lumen** If any
 (a) **Total**
 (β) **Partial** Richter's hernia
 And ultimately resulting in gangrene of the contents
- Causes (1) **Excessive exertion** Straining
 (2) **Too tight neck**
 (a) **Sudden appearance of hernia**
 (b) **Sudden increase in contents**
 (c) **Inflamed perineck tissues**
 (3) **Contents**
 (a) **Sudden descent**
 (b) **Sudden increase in contents**
 (c) **Volvulus of the contents**
- Path (1) **Contents**
 (a) **Small intestines**
 (b) **Omentum**
 (c) **Large intestines**
 (2) **Constrictor**
 (A) **Inguinal**
 (a) **External abdominal ring**
 (b) **Perineck fibrosis**

- (B) Femoral
 - (a) Deep crural arch
 - (b) Gimbernat
 - (c) Hey's ligament
- (C) Umbilical peri neck fibrosis
- (3) *Morb anatomy* :
 - (A) Stage of viable gut :
 - (a) Congestion
 - (b) Pulsating mesenteric vessels
 - (B) Stage of hæmorrhagic infarction :
 - (a) Blood supply cut off
 - (b) Mesenteric vessels non pulsating
 - (C) Stage of gangrene : At
 - (a) Site of constriction
 - (b) Apex
 - (D) Stage of complications :
 - (a) Constriction ring → **stricture**
 - (b) Transmigration
 - (α) Inflamed hernia
 - (β) **Peritonitis**
 - (c) **Perforation** :
 - (a) Proximal to constriction ring
↓ **General peritonitis**
 - (β) Distal to constriction ring
↓ **Hernial sac abscess**
↓ **Fæcal fistula**

(4) *Causes of death*

- (1) **Shock** :
 - (a) Nervous mesenteric
 - (b) Circulatory
- (2) **Toxæmia** : Proteoses + amino acids
- (3) **Perforation** → Peritonitis
- (4) **Paralytic ileus**

Clinic (1) Lump at a hernial site

- (a) Tense
- (b) Tender
- (c) Dull
- (d) Irreducible
- (e) No impulse

+ (2) Acute intestinal obstruction

+ (3) Peritonism

Diff diag

- (1) Acute abdomen
- (2) Torsion of testis
- (3) Funiculitis
- (4) Inflamed hydrocele, hæmatocele, pyocele
- (5) Ruptured varicocele
- (6) Acute inguinal lymphadenitis

- (7) *Different grades of complicated hernia*
 (a) Irreducible
 (b) Inflamed
 (c) Obstructed
 (d) Strangulated

Abnormal varieties of strangulated hernia

(1) *Richter's hernia*

Def Strangulation of only a part of circumference of lumen

Site Femoral hernia

Clinic (a) Strangulation syndrome

+ (b) Incomplete obstruction syndrome

Compl Perforation → (a) Peritonitis

(b) Faecal fistula

Treat Early diagnosis → early operation

(2) *Maydl's retrograde strangulation*

Def Strangulation on both the sides of constriction ring

Path Intestines (a) Entering into the sac

↓ (b) Leaving the sac

↓ (c) Loop in peritoneal cavity

↓ (d) Again entering the sac

↓ (e) Leaving the sac

Strangulation (A) Intra sacular distal

(1) From (a) to (b)

(2) From (d) to (e)

(B) Intra peritoneal proximal

(c)

Clinic (1) Strangulated hernia

(2) Peritonitis with free fluid

(3) Peritonism marked

Compl General peritonitis

Treat Operation

Diag Gut above the constriction more unhealthy than gut below

(3) *Reduction en-masse*

Def Reduction of the hernial sac with the unrelieved strangulated contents into the peritoneal cavity

Path (a) Reduction en masse

(b) Reduction en bissac

(c) Reduction of infected sac fluid

(d) Reduction of gangrenous intestines

(e) Rupture of the sac or contents

(f) Volvulus of the reduced loop

Clinic (1) *History of taxis*

(2) Sudden painful reduction

(3) Continuation of strangulation syndrome

or (4) Appearance of peritonitis syndrome

Compl (1) Peritonitis

(2) Paralytic ileus

Treat (1) Herniotomy → drainage of sac fluid

↓ (2) Find out the condition

↓ (3) Exploratory laparotomy

↓ (4) Retrieve the sac from inguinal canal

- ↓ (5) Treat the strangulation
- ↓ (6) Peritoneal toilet
- ↓ (7) Drainage (a) Internal peritoneal
- (b) External inguinal

(4) Strangulated sliding hernia

Treatment of strangulated hernia

(1) Taxis

- Ind (a) Recent, hitherto-reducible hernia
- + (b) No inflammation
- + (c) Refusal for operation
- or (d) No surgical help near by
- or (e) Infants

Tech (1) Preliminary narcotic

- (2) Trendelenburg position
- (3) Regional relaxation
- (4) Manipulations

Compl Reduction *en masse* (See above)

(2) Postural treatment

- Ind (a) Recent, sudden and first irreducibility
- (b) In the door of the operation theatre

Tech (1) Narcotic morphia

- (2) Posture
- (a) Trendelenburg in adults
- (b) Judgement of Solomon in infants

Post. treat Herniotomy at the time of choice

(3) Operative treatment.

- Pre operative (a) Morphia
- (b) Skin preparation
- (c) Catheterisation

If seen after 12 hours

- (d) Gastric or duodenal drainage
- (e) Anti shock measures
- (f) 5% glucose saline
- (g) Anti gas gangrene serum

Anæsth (1) Spinal

- (2) Local novocain 1 or 2%
 - (a) First point medial to ant sup spin
 - (b) Peripheral nerves
 - (c) Skin and subcutaneous tissues
 - Diamond shaped
 - (d) Coverings and sac
 - (e) Mesentery and omentum

Steps (1) Incision

- (A) Inguinal along and over the long of the tumour
- (B) Femoral Lotheisen's inguinal incision
- (C) Umbilical. Below the neck.

- (2) Exposure of the sac
- (3) Isolation and gauze protection of the wound
- ↓ (4) Incision and evacuation of the sac
- ↓ (5) Division of constriction
 - (a) Inguinal up and in
 - (b) Femoral inwards
 - (c) Umbilical lateral
- (6) Withdrawal and examination of contents
 - (A) Safe
 - (a) Fluid clear and odourless
 - (b) Gloss present
 - (c) Return of colour
 - (d) Peristalsis present
 - (e) Elastic feel
 - (f) Mesenteric pulsations present
 - (g) Bleeding appendices epiploica
 - (B) **Dangerous** Opposite of (A)
 - (C) **Doubtful** Midway between (A) & (B)
- (7) Treatment of contents
 - (A) Omentum excise after transfixion
 - (B) Bowels
 - (1) If safe
 - Return into peritoneal cavity
 - (2) If doubtful
 - Treat with warm saline and wait
 - (3) If gangrenous
 - (a) Small area
 - (α) Purse string
 - (β) Infold & free omental graft
 - (b) Constriction ring
 - Invaginate
 - (c) Extensive area
 - (1) Small intestines
 - (a) Good general condition
 - Resect & anastomose
 - (β) Moderate condition
 - Resect + drain ends
 - (γ) Bad general condition
 - Proximal short circuit
 - ↓ Exteriorisation of loop
 - (δ) Hopeless condition
 - Proximal enterostomy
 - ↓ Exteriorisation of loop

- (2) Large intestines
 - (α) Colostomy with
 - (1) Resection
 - or (2) Exclusion
 - ↓ (β) Secondary anastomosis
- (8) Excision of the sac with ligature of the neck
- (9) Radical operation
 - . if (α) General condition good
 - (b) Sepsis not present
- (10) Drainage of the wound

Techniques

(1) Immediate resection and anastomosis

- Advant (a) Absence of starvation cachexia
 - (b) Absence of abdominal wall infection
 - (c) Absence of faecal fistula
 - Ind (1) Early stage
 - (2) Good general condition
 - (3) Young age
 - (4) High site
 - (5) Length not too much
 - (6) Experienced surgeon
 - Tech (A) Removal of
 - (1) Gangrenous portion
 - + (2) Damaged proximal intestines 1-2 feet
 - To avoid post operative peritonitis due to
 - (a) Leakage from anastomosis
 - (b) Perforation
 - (c) Paralytic ileus
 - (d) Distension necrosis
 - ↓ (B) Anastomosis
 - (a) Varieties (α) End to-end
 - (β) Lateral
 - (γ) End to side
 - (b) Opening not less than two inches
 - (c) Site in situ
 - + (C) Proximal enterostomy
 - Tech One foot above the anastomosis
 - Through a stab wound
 - Ind (a) Gross distension
 - (b) Peristalsis absent
 - Contraind (a) No undue distension
 - (b) Peristalsis present
- (2) Exteriorisation of the Intestines
- Def Leaving gangrenous segment out of the wound with proximal enterostomy
 - Ind (1) Bad general condition
 - (2) Extensive gangrene

- (2) **Paralytic ileus**
- (3) **Peritonitis:**
: Entrance of sac fluid in abdomen
- (4) **Fæcal fistula**
- (5) **Enteritis**
- (B) **Urinary :**
 - (1) **Acute retention**
 - (2) **Urinary sepsis**
- (C) **Chest :**
 - (1) **Pneumonia**
 - (2) **Collapse lung**
 - (3) **CEdema lung**
 - (4) **Infarction lung**
- (D) **Local :**
 - (1) **Sepsis of the wound**
 - (2) **Cellulitis of abdominal wall.**
In umbilical hernia

Post operative sequelæ

- (1) **Recurrence**
- (2) **Intestinal stenosis**
 - (a) **Constriction ring**
 - (b) **Anastomosis site**

Anatomical varieties of hernia

(1) **INGUINAL HERNIA**

Varieties (A) **Oblique inguinal hernia** .

Def Hernia which enters the inguinal canal through the internal abdominal ring

- Etiology**
- (1) **Congenital**
 - (a) **Patent funicular process**
 - (b) **Weak inguinal muscles**
 - (α) **Malgaigne's bulges**
 - (β) **Weak cremaster**
 - (2) **Acquired**
 - (a) **Ilio inguinal paralysis**
 - (b) **Prolapse of the cord due to**
 - (α) **Poor musculature**
 - + (β) **Repeated straining**

- Pathology**
- (1) **Congenital** No obliteration at int ring
 - (a) **Of vaginal process :**
Enters tunica vaginalis
 - (b) **Of funicular process :**
- Upto the top of the testis
 - (2) **Infantile:** Obliteration at internal ring
 - (a) **Retro-funicular**
 - (b) **Intra-funicular :**
Two layers of peritoneum

- Coverings (a) Skin and subcutaneous tissues
 (b) External spermatic fascia
 (c) **Cremasteric fascia**
 (d) **Internal spermatic fascia**
 (e) Extra peritoneal tissues
- Associations (1) **Malgaigne's bulges**
 (2) **Imperfect descent of testis**
 (3) Femoral hernia
 (4) **Hernia on the other side : 30%**
- Clinic (a) **Sudden complete descent**
 or (b) **Gradual progressive descent**
 (1) **Bubonocoele** .
 Hernia upto external ring
 or (2) **Scrotal**
 Hernia entering the scrotum
 (a) **Reducible**
 or (b) **Irreducible**

(B) Direct inguinal hernia .

Def Hernia through the post wall of inguinal canal (Hesselbach's triangle)

- Anat (1) Bounded by
 (a) Inferior epigastric art
 Lateral
 (b) Lower border of conjoined tendon
 Above
 (c) Ilio pectineal insertion of conjoined
 Below
 (d) Lateral border of the rectus
 Medial
- (2) Covered by
 (a) Skin and subcutaneous tissues
 (b) External spermatic fascia
 (c) **Conjoined tendon aponeurosis**
 (d) **Transversalis fascia**
 (e) Extra peritoneal tissues
- Etio (1) **Acquired :**
 Due to chronic intermittent strain
 (2) **Congenital**
 (a) Circular deficiency in post. wall
 + (b) Tubular peritoneal process
- Clinic (1) Age elderly
 (2) Bilateral more often
 (3) Etiology . chronic strain
 (4) Progress gradual
 (5) Size small or moderate

(6) Site not scrotal

Being a bulging of all the layers of the abdominal wall it progresses centrifugally and progresses upwards and outwards due to resistance of the Poupart, the rectus and the pyramidalis. It seldom enters the scrotum

(7) Appearance and reduction without strain

Differential diagnosis between indirect and direct inguinal hernia

<i>Clinic</i>	<i>Indirect</i>	<i>Direct</i>
Age	Infancy to 30	After 30
Shape	Oval or pear	Globular
Side	Unilateral 75%	Bilateral 60%
Extent	Scrotal	Seldom scrotal
Reducibility	Often irreducible	Always reducible
Relation to cord	In front and outer	Above and inner
Direction	Oblique along canal	Straight out of ext ring
Inguinal canal	Posterior wall firm	Post. wall deficient
Progress	Sudden or rapid	Gradual and slow

- Clinical test
- (1) Make the patient lie down
 - (2) Reduce the hernia
After relaxing the inguinal region
 - (3) Press 5" above the midpoint of
 - (a) Anterior sup iliac spine
 - ↓ (b) Symphysis pubis
 - (4) Let the patient stand and cough
 - (5)
 - (a) Non descent oblique
 - (b) Descent direct

- Operative evidence
- (1) Oblique
 - (a) Neck to the lateral side of inf epig art
 - (b) Sperm cord close and deep to the str
 - (2) Direct
 - (a) Neck to the medial side of inf epig art
 - (b) Spermatic cord anterior

(C) Interstitial inguinal hernia

Etio Congenital

- Morb anat
- (A) Patent processus vaginalis
 - + (a) Pro peritoneal diverticulum
 - (b) Intermuscular diverticulum
 - (c) Pre muscular diverticulum
 - (d) Retro peritoneal diverticulum

(B) Absent processus vaginalis :

- + (a) Pre-muscular sac
- (b) Retro-peritoneal sac

Associations: (1) Mal-descended testis
(2) Absent cremaster
(3) Superimposed rings

Clinic: Bulging external to and above the external ring

Compl: (1) Reductio-en-bissac
(2) Recurrence

(D) **Sliding inguinal hernia :**

Etio: (a) Elderly patients
(b) Visceroptosis

Path: Visceroptotic sliding of posterior peritoneum with retro peritoneal cellular tissues and colon down along the inguinal canal into the scrotum.

Morb anat. (1) Peritoneum is absent on the posterior aspect of the sac
(2) Posterior wall of the sac is made up by :
(a) Retro peritoneal cellular tissues
(b) Extra peritoneal aspect of colon

Sequence: (a) Posterior wall }
 ↓ (b) Fundus } : sliding peritoneum
 ↓ (c) Anterior wall }

Clinic: (a) Senile patients
(b) Large size

Compl: (1) Irreducibility
(2) Incarceration
(3) Operative trauma to .
 (a) Cæcum or colon
 (b) Colon vessels
(4) Post operative retro-peritonitis

Differential diagnosis of inguinal hernia :

- (1) **Femoral hernia :**
 - (a) Below and lateral to the pubic spine
 - (b) No impulse through external ring
- (2) **Mal-descended testis :**
 - (a) Absence from scrotum
 - (b) Testicular feel on pressure
- (3) **Encysted hydrocele of cord or canal of Nuck :**
 - (a) Irreducibility
 - (b) Moves with the testis
 - (c) Trans-illumination
- (4) **Inguinal or funicular growths :**
 - (a) Lipoma

- (b) Fibroma
- (c) Lymphangioma
- (5) **Varicocele :**
 - (a) Worms in a bag feel
 - (b) Fills from below upwards
- (6) **Large hydrocele :**
 - (a) Cord felt at the top
 - (b) No impulse
 - (c) Translucency
- (7) **Inguinal lymphadenitis :**
 - (a) Lobulated feel
 - (b) Other discrete glands
 - (c) No impulse
 - (d) Septic inflammation
- (8) **Inguinal cold abscess .**
 - Primary focus in hip, pubis or spine

Treatment of inguinal hernia

- (1) Truss (See above)
- Measure Girth midway between iliac crest and trochanter
- (2) **Injection treatment :** (See above)
- (3) **Operative treatment**
- Anæ th (1) Spinal Stovaine
- (2) Local Novocain 1% in normal saline
+ Adrenalin 1 in 1,000 1 m. to 10 c cs
- Tech (A) Subcuticular wheals
 - (a) Ant. sup. spine
 - (b) Saphenous opening
 - (c) Suprapubic crease midline
- (B) Subcutaneous infiltrations
 - (a) Joining the wheals
 - (b) Around the scrotum
- (C) Deep infiltrations
 - (a) Nerves
 - (b) Inguinal canal
 - (c) Spermatic cord

Operations (A) **Herniotomy : Upto 4 years of life**

- (1) **Russell .**
 - (a) Incisions
 - (α) 5 ' above and parallel to Poupart
 - or (β) Along the flexion crease
 - (b) Division of ext oblique aponeurosis
Without opening ext ring
 - (c) Separation of cremaster fibres
 - (d) Exposure of the cord and sac
 - (e) Isolation of the sac

- (a) From outside
- or (β) From inside
- (f) Reduction of contents
- (g) Torsion and transfixion of the neck
- (h) Excision of the sac
- (i) Closure of the wound
 - (α) Cremaster ob catgut or silk
 - (β) Ext. oblique 1 catgut or silk
 - (γ) Subcutaneous layers

(2) Mitchell Bank :

- (a) Separation of the tissues of the cord
- (b) Isolation of the sac
- (c) Traction on the sac
 - Till neck is on level with ext ring
- (d) Ligature and division of the neck
 - At the ext ring
- (e) Closure

(B) Herniorrhaphy :

- Ind (a) After 4 years of age
- (b) Weakness of muscles
- (α) Primary
 - (β) Secondary

(1) Halstead or Andrew :

- Syn (a) Non transplantation method
- (b) Anterior imbrication method

- Ind (1) Age between 4 and 12
- (2) Non descent of testis

Contraind Direct hernia

Tech **Cord submuscular :**

- (a) Cord
- ↓ (b) Conjoined tendon to Poupart
- ↓ (c) Overlapped external oblique

Sequela Direct hernia

(2) Bassini : After 12 years of age

Tech **Cord intermuscular :**

- (a) Conjoined tendon to Poupart
- ↓ (b) Cord
- ↓ (c) External oblique suture

(3) Andrews :

Syn Posterior imbrication method

Ind Weak inguinal canal

Tech **Cord interaponeurotic :**

- (a) Conjoined tendon to Poupart
- ↓ (b) Upper ext oblique to Poupart
- ↓ (c) Cord
- ↓ (d) Lower to upper ext. oblique

(4) Modified Halstead :

- Ind (a) Direct hernia
 (b) Longstanding large hernia
 (c) Recurrent hernia
 (d) Hernia with varicocele

Tech Cord subcutaneous :

- (a) Conjoined tendon to Poupart
 ↓ (b) External oblique suture
 ↓ (c) Cord

(C) Hernioplasty :

- Ind (a) Large hernia with weak musculature
 (b) Failure of posterior wall of inguinal canal
 (c) Recurrent hernia

(1) Ring construction : Internal abdominal ring

- Ind (a) Medium oblique inguinal hernia
 + (b) Good musculature
 + (c) Stretched rings

Steps (1) Herniotomy**(2) Internal ring reconstruction**

- (a) Simple lateral suture
 Lateral to the cord
 (b) Medial reconstruction
 Medial to the cord
 (a) Silk darning
 (β) Fascial strip darning
 (γ) Turner's pedicled fascia lata

- Ind (1) Men over 45
 (2) Longstanding hernia
 (3) Direct hernia
 (4) Sliding hernia

(2) Silk lattice repair :**Tech Silk lattice without tension between**

- (a) Conjoined tendon
 & (b) Poupart
 Behind the cord

(3) Gallie's living fascial graft :**Tech (A) Darning : by**

- (a) Fascia lata strips
 (b) Ext. oblique aponeurosis strips
 (c) Peritoneal strips from excised sac

(B) Many tailed fascial graft :

Fascia lata

(C) Pedicled muscle graft

Tensor fasciæ femoris

- Ind (a) Large hernia
 (b) Direct hernia
 (c) Sliding hernia
 (d) Recurrent hernia
 (e) Umbilical hernia
 (f) Incisional hernia
 (g) Muscular weakness
 (h) Laborious occupations

(4) Zimmerman (Med Ann. 1939)

Ind Direct inguinal hernia

Object Repair of the canal floor

- Steps (a) Dissection of transversalis off the sac
 (b) Transversalis fascia to Poupart
 Behind the cord
 (c) Incision of lower ext oblique flap
 At the internal ring
 (d) Suture
 of Medial part of lower ext. obl flap
 to (β) Transversalis fascia
 behind the cord
 beneath the internal oblique

(8) Bloodgood

Ind Direct hernia

Tech Rectus sheath flap to Poupart

*Special points and variations***(A) Schmieden's technique**

Upward and lateral displacement of the emergence of the cord at the internal ring with Bassini technique

(B) Other methods of approach to inguinal canal

- (a) Intra-peritoneal midline laparotomy
 (b) Extra peritoneal midline incision
 Cheatle Henry

(C) Suture material in hernia

- (a) 20 days chromicised catgut
 (b) Silk
 (c) Living fascial graft or strip

(D) Congenital hernia of tunica vaginalis

- (a) Child reconstruct the tunica
 (b) Adult (α) Excision } of the tunica
 (β) Eversion }

(E) Lipoma of the cord

Remove

- { (F) Female inguinal hernia
- { (G) Inguinal hernia with ectopic testis
- Points (1) Inguinal canal is rudimentary
Take care of ext. iliac vessels
- (2) Excise the round ligament or testis
- (3) Obliterate the inguinal canal
- (H) Very large hernia
- Pre oper (1) Trendelenburg with purging and fasting
For six weeks
- (2) Local anaesthesia
- Oper (a) Excision of the omentum
- (b) Operation by stages
- Post. oper Belt
- (I) Sliding hernia
- (a) Take care of the colon
- (b) Take care of the vessels
- (c) Take care of the extra perit. cellular tissues
- (d) Take care of post-operative period
- (a) Paralytic ileus
- (β) Chest complications

Operative mishaps

- (1) Injury to
 - (a) Nerves (α) Ilio inguinal
 - (β) Ilio hypogastric
 - (b) Vessels (α) Femoral vein
 - (β) Inf. epig. vessels
 - (γ) Cæcal vessels
 - (c) Vas
 - (d) Bladder
 - (e) Intestines, circum. colon
- (2) Hernial sac
 - (a) Tearing of the peritoneum
 - (b) Overlooked diverticulum

After treatment

- (1) Three weeks in bed
- (2) Three months light work
- (3) Three years be careful
- (4) Permanent cure
- ()
- ()
- ()
- ()
- (e) Chronic dysuria
- (f) Pregnancies
- (g) Laborious work

Special post operative complications

- (1) Hæmatoma:

- (2) Acquired theory .
 (a) Repeated strains
 (b) Obesity with weakened fibrous planes
 (c) Wide pelvis in females
- Clinic (1) **Swelling** : Round, elastic, reducible or irreducible
 (A) Position .
 (a) Below the inner end of the Poupart
 ↓ (b) Upper part of the thigh
 ↓ (c) Below the outer part of the Poupart
 (B) Neck
 (a) Below the Poupart
 (b) Lateral to pubic tubercle
 (c) Medial to femoral vessels
 (C) Walls palpable
- Diff diag (A) *From reducible femoral hernia* :
 (1) **Inguinal hernia** :
 (a) Relation to Poupart and pubic tubercle
 (b) No palpable walls
 (2) **Saphenous varix** :
 (a) Venous hum
 (b) Cruveilhier's thrill
 (c) Kelly's quiver
 (d) Varicosity of the leg
 (3) **Psoas abscess** :
 (a) Primary focus
 (b) Hourglass fluctuation
- (B) *From irreducible femoral hernia*
 (1) **Irreducible inguinal hernia** :
 (See above)
 (2) **Inguinal or femoral lymphadenitis** :
 (a) Septic focus
 (b) Nodular
 (c) No stalk
 (3) **Inguinal or femoral lipoma** :
 (a) Lobulations
 (b) No stalk
 (4) **Femoral aneurysm** :
 (a) Pulsations
 (b) Pressure signs
 (5) **Psoas bursa** :
 (a) Flexion of the hip
 (b) Psoas spasm
- (C) *From strangulated femoral hernia*
 (1) **Suppurating glands of Cloquet**
 (2) **Obturator hernia** :

- (a) More medial
- (b) Obturator neuralgia
- (3) **Rupture of adductor longus:**
Painful loss of adduction thigh

Important points

- (a) Early and frequent strangulation
 - (b) Frequent Richter's hernia
 - (c) **Constricting agents:**
 - (a) Gimbernat
 - (b) Neck
 - (d) Bladder implication
 - (e) Relations of femoral v. and obturator art.
 - (f) Common in females
- Treat (A) **Lotheisen's or Annandale's operation:**
- (1) Inguinal incision
 - (2) Division of ext. oblique
 - (3) Division of transversalis fascia
 - (4) Isolation of the neck
 - (5) Transfer of the sac to the inguinal region
 - (6) Incision of the sac
 - (7) Reduction of contents
 - (8) Transfixion and ligature of the neck
 - (9) Excision of the sac
 - (10) Herniorrhaphy suture of
 - (a) Conjoined tendon to Cooper's ligament
 - or (b) Poupart to pectineal fascia
 - (11) Suture of ext. oblique
 - (12) Closure
- (B) **Standard operation:**
- (1) Incision
 - (a) Crease
 - (b) Inguinal canal
 - (2) Exposure of
 - (a) Ext. oblique aponeurosis
 - (b) Poupart
 - (c) Scarpa's Δ
 - (3) Scarpal
 - (a) Exposure of the sac
 - (b) Reduction of contents
 - (c) Division of the neck
 - (4) Inguinal
 - (a) Exposure of the sac
 - (1) Incision of ext. oblique
 - (2) Incision of cremaster
 - (3) Displacement of cord

- (4) Incision of transversalis fascia
- (5) Exposure of the neck
 - (b) Ligature and division of the neck
- (5) Closure of the opening
 - Conjoined to Cooper
- (6) Repair of the wound
- (C) Low operation
 - (1) Incision
 - (a) Crease
 - (b) Below and parallel to Poupart
 - (c) Vertical over saphenous opening
 - (2) Isolation of the sac
 - (3) Reduction of the contents
 - (4) Ligature of the neck
- (D) Henry's extra peritoneal approach
 - Through abdominal midline incision

Methods of closure of the defect

- (A) Suture
 - (1) Standard
 - Conjoined to Cooper
 - (2) Lotheisen
 - Conjoined to Cooper and Poupart
 - (3) Marcy's purse-string
 - (a) Poupart
 - ↓ (b) Gimbernat
 - ↓ (c) Pectineal fascia
 - ↓ (d) Crural sheath
 - ↓ (e) Poupart
 - (4) Bassini
 - Poupart to pectineal fascia
 - (5) Lockwood
 - Poupart to Cooper
- (B) Fascial strip
 - Poupart to Cooper
- (C) Fascial flap
 - (a) Wyllis Andrews
 - Conjoined + ext oblique to Cooper
 - (b) Bloodgood
 - Rectus sheath to Cooper
- (D) Crural canal plug
 - (1) Two ligatures method (See above)
 - (a) Neck ligatured and cut crural aspect
 - + (b) Neck ligatured and cut inguinal aspect
 - ↓ (c) Leave in the intervening portion in femoral canal
 - (2) Inverted sac plug
 - (3) Auto transplants

(3) UMBILICAL HERNIA

- Varieties (1) **Congenital umbilical hernia:**
 . Non closure of umbilicus

(A) Exomphalos -

Def Protrusion of the intestines at the umbilicus in the base of the umbilical cord, with non closure of abdominal parietes

- Varieties** (a) **Ruptured** : No covering
 (b) **Non ruptured** : Amniotic covering
- Compl** (1) Prolapse intestines
 (2) Peritonitis
 (3) Intestinal obstruction

(B) Minor :

Path Incomplete retraction of intestines into the abdomen

Clinic Congenital hernia of the loops of intestines into the umbilical cord

- Compl** (a) Injury to intestines
 At the cord ligature
 (b) Peritonitis

Treat (1) **Conservative** alcohol application
 (a) Narcosis
 (b) Cleansing
 (c) Absolute alcohol compresses
 (d) Bandage

(2) Immediate plastic operation :

- (a) Excision of amniotic covering
 (b) Reduction of prolapsed bowel
 (c) Freshening of defect margins
 (d) Closure of the defect

- Difficulties** (1) Refusal of intestines to go in
 (2) Non apposition of defect margins

(2) Infantile umbilical hernia :

Etio (a) Delayed umbilical closure
 or (b) **Increased intra abdominal pressure**
 ↓ Stretching of newly formed umbilical scar

- Clinic** (1) Age about 3 years
 (2) Reducible protrusion at the umbilicus

Treat (A) **Conservative** :
 (a) Firm binder } : for 18 months
 or (b) Rubber belt }
 + (c) Treat the etiology circumcision

(B) Operation :

- (1) **Subcut silkworm purse-string** :
 Ind (a) Small size
 (b) Reducible
 (2) **Open operation**

(3) Adult para-umbilical hernia :**Etio :** Women of 40

· Obesity

: Repeated pregnancies

Cause : (a) Stretched umbilicus due to :

(a) Chronic strain

(β) Increased abdominal pressure

(b) Recurrence of cured infantile hernia

Morb anat : (1) Supra umbilical

(2) Infra umbilical

Clinic (1) **Blind hernia :**

Chronic dyspepsia

Worse on lying down

↓ (2) **Reducible umbilical protrusion .**

With impulse on straining

↓ (3) **Irreducible umbilical swelling .**

Gigantic, lobulated, no impulse

Compl (a) **Adhesions**(b) **Loculations**(c) **Irreducibility**(d) **Incarceration**(e) **Strangulation : Mortality 30%**(f) **Fæcal fistula**(g) **Intertrigo****Treat** **Operative :****Pre oper** (a) Reduction of fat

(b) Care of the heart and chest

(c) Intestinal antiseptics and laxatives

(d) Skin preparation

Anæsth (1) **Spinal**

(2) Regional novocain infiltration

(3) General contraindicated

Operation **Mayo :**

(1) Transverse elliptical incision

Well away from the hernial neck

(2) Isolation of the sac neck

(3) Opening of the sac neck

(4) Excision of

(a) Skin

(b) Fat

(c) Sac

(d) Adherent omentum

(5) Return of the intestines

(6) Repair of the abdominal wall .

(A) **Overlapping method :**

(a) Transverse overlapping of .

- (α) Peritoneum
- (β) Posterior rectus sheath
- (b) Vertical union of rectus muscle
- (c) Transverse overlapping of Anterior rectus sheath

(B) **Gallie's fascial graft** -

- (a) Fascial strip darning
- (b) Many tailed fascial graft

(7) Drainage for 48 hours

Post. compl (A) Operative

- (a) Trauma to the bowel
- (b) Trauma to the peritoneum

(B) Post operative

- (1) **Respiratory** :
Pneumonia, collapse lungs
- (2) **Abdominal** :
(α) Acute gastric dilatation
(b) Paralytic ileus
- (3) **Circulatory** :
(a) Shock
(b) Heart failure

(C) Sequela recurrence

(4) **VENTRAL HERNIA**

Def. Protrusion of peritoneal cavity through a defect in the ant. abdominal parietes

Etio (a) **Weak spot** :

- (α) Anatomical
 - (1) Small holes in linea alba
 - (2) Divarication of the recti
- (β) Acquired
 - (1) Incisional
 - (a) Sepsis
 - (b) Burst abdomen
 - (2) Stretching.
 - (a) Repeated pregnancies
 - (b) Incomplete convalescence
After laparotomy
 - (3) Muscular paralysis nerve trauma
 - (4) Sepsis intra muscular abscess

+ (b) **Increased intra abdominal pressure**

or (c) **Traction** : Extra peritoneal lipoma

Path (1) **Potential hernia** :

. Peritoneal process drawn out as a result of traction by an adherent lipoma

↓ (2) **Latent hernia** :

. Empty peritoneal sac masked by fat

↓ (3) **Protuberant hernia :**

Big sac with omentum and intestines

Varieties (A) **Median ventral hernia :**

(1) **Median epigastric :**

Etio (a) Extra peritoneal lipoma

or (b) Holes in linea alba

or (c) Operative incision

+ (d) Strenuous occupation

Clinic (1) **Latent :**

Dyspepsia worse on recumbency

(2) **Protuberant :**

Post operative

Diff ding Gastric ulcer

Treat Exploration and hernioplasty

(2) **Median hypogastric :**

Etio (1) Women with repeated pregnancies

(2) Midline incision

Clinic Protuberant type

Contents Pregnant uterus

Treat (a) Sterilisation

(b) Suture of the recti

(c) Super imposition of fasciæ

(3) **Complete median :**

Etio Divarication of the recti

Clinic On raising the head in supine position

(1) Insinuation of ulnar border of the hand between the two recti

(2) Median linear protuberance between the recti

Treat (1) **Conservative :** Abdominal support

(2) Rectus suture with super imposition of sheath

(B) **Lateral ventral hernia**

(1) **Incisional ventral hernia :**

Etio (a) **Bad suturing :**

(a) Intervening gaps

(β) Too tight sutures

(γ) Burst abdomen

(b) **Sepsis**

(c) **Prolonged drainage**

(d) **Stretching :**

(a) Incomplete convalescence

(3) Chronic or intermittent strain

Varieties (a) Defined neck

(b) Large multilocular

Compl. Strangulation :

- (a) Contains small intestines
- (b) Signs of obstruction masked
- (c) Toleration of toxæmia
- (d) Gangrene common & swift

Treat Operation Hernioplasty**(2) Scar ventral hernia :**

- Etio** (a) Incisional (See above)
 (b) Gangrene, ulceration or abscess
 Of abdominal wall

Path All layers are welded and thinned out

Clinic Visible peristalsis through thin wall

- Compl** (a) Adhesions
 (b) Irreducibility
 (c) Chronic intestinal obstruction
 (d) Strangulation
 (e) Ulceration
 (f) Fæcal fistula

- Treat** (1) Conservative
 (a) Belt and support
 + (b) Remove the etiology
 (2) Operative
 (A) Herniotomy
 Open the peritoneum at a distance from the hernial sac

↓ **(B) Hernioplasty**

- (a) **Overlapping of layers :**
Small hernia
- (b) **Gallie darning :**
Large hernia
- (c) **Many-tailed fascial graft :**
Very large hernia
- (d) **Rectus transplantation :**
 - (1) Detachment of recti in sections from pubis
 - (2) Re suture to opposite sides of midline
 - (3) Rectus sheath suture

- Post treat** (a) Prolonged convalescence
 (b) Prolonged abdominal belt

(3) Interstitial ventral hernia :

- Etio** (a) Rupture muscle
 (b) Gummy muscle
 (c) Abscess muscle } abdominal wall

(4) Paralytic ventral hernia :

Etio (a) Operative nerve trauma

↓
(b)

Treatment of ventral hernias

- (1) Conservative abdominal belt and straps
- (2) Operative
 - (A) Herniotomy
 - ↓ (B) Hernioplasty
 - (a) Overlapping
 - (b) Fascial transplants

Post operative treatment of ventral hernias

- (1) Prolonged convalescence
- (2) Treatment of chronic and intermittent straining
- (3) Prolonged abdominal support

Post operative complications of ventral hernias

- (1) Hiccough
- (2) Acute gastric dilatation
- (3) Paralytic ileus
- (4) Respiratory complications
- (5) Burst abdomen
- (6) Recurrence

(5) LUMBAR HERNIA

Etio (A) Congenital

- (a) Subcostal
- (b) Petit

(B) Acquired

- (a) Scar sepsis and stretching
- (b) Paralysis trauma to nerves

Clinic Reducible swelling after a lumbar operation

Diff Diag (a) Cold abscess

(b) Lipoma

(c) Phantom hernia

Treat (1) Conservative Abdominal belt

(2) Operative Fascial hernioplasty

(6) OBTURATOR HERNIA

Anat Hernia through obturator foramen

Etio Parous women past 55

Clinic (a) Swelling in medial part of Scarpa triangle

(b) P V or P R.

(c) Obturator neuralgia Howship Romberg

Compl Strangulation

(a) Total

(b) Partial Richter

Diag (1) Strangulation syndrome

(2) Adduction spasm of the thigh

(3) Obturator neuralgia pain in knee

Treat Combined operation

(A) Lower exposure → drainage of the sac

↓ (B) Laparotomy → (a) Reduction of contents

↓ (b) Treatment of strangulation

↓ (c) Excision of the sac

↓ (C) Hernioplasty

Closure of the neck by costal cartilage transplants

(7) GLUTEAL HERNIA

Var eties (A) Gluteal through greater sacro-sciatic notch

(a) Supra pyriformis

(b) Infra pyriformis

(B) Sciatic through lesser sacro-sciatic notch

Clinic (1) Acute strangulation syndrome⁴

+ (2) Abscess syndrome in gluteal region

Diff diag (1) Aneurysm gluteal or sciatic

(2) Abscess Acute or chronic

(3) Lipoma subfascial

(4) Weaver's bottom bursa under gluteus max

(5) Sciatica

Treat Open exploration Of every acute gluteal swelling

(8) PERINEAL HERNIA

Et o Females

Anat (A) Ischio rectal fossa

(B) Lateral vaginal wall

Space of Schwalbe

(C) Labium

(D) Perineum

(E) Rectal prolapse rectum

Cause (a) Post-operative

(b) Prolapse uterus or rectum

D ff diag (1) Sub-peritoneal lipoma or fibroma

(2) Cold abscess

(3) Simple visceral prolapse

Treat (1) Exploration and repair

+ (2) Treatment of etiology

IMPORTANT POINTS

(1) Regional indications of truss

(A) Oblique inguinal hernia contraindicated

(B) Direct inguinal hernia indicated

(C) Femoral hernia contraindicated

(D) Umbilical hernia

(a) Infants indicated

(b) Adults contraindicated.

(2) Every hernia is bound to increase in size due to increased abdominal pressure caused by

(a) Coughing

(b) Vomiting

- (c) Micturition
 - (d) Defæcation
 - (e) Parturition
 - (f) Muscular work
- (3) Truss in adults predisposes to strangulation when hernia comes down
- (4) *Chief cause of recurrence after a hernia operation is*
 (a) *Low removal of neck*
 or (b) *Failure to close the canal at its commencement*
 or (c) *Damage to muscular sphincteric mechanism*
- (5) The essential question in a hernia operation
 Can normal mechanism of the canal be kept or must it be replaced by something different?
- (6) *Groups of operations for inguinal hernia*
- (A) *Congenital oblique inguinal hernia* *Hermotomy*
 - (a) Removal of entire sac
 - + (b) Accurate reconstruction
 - (B) *Large oblique inguinal hernia* *Herniorrhaphy*
 - + Good muscles
 - + Stretched rings
 - (a) Removal of entire sac
 - + (b) Plastic strengthening of posterior wall
 - + (c) Restoration of diameter of internal ring
 - (C) *Direct or large oblique* *Hernioplasty*
 - + *Atrophied muscles*
 - + Failure of post wall of ing canal
 - (a) *Gallie's fascial darning or graft*
 - or (b) *Bloodgood's rectus flap*
- (7) *Strangulated hernia is the most common cause of acute intestinal obstruction*
- (8) *Tender irreducible swelling at an hernial orifice with acute intestinal obstruction syndrome = strangulated hernia*
- (9) *In every case of acute intestinal obstruction, examine every hernial orifice*
- (10) *Principal factor in mortality in strangulated hernia is delayed operation or ill applied taxis*
- (11) 2-4% of inguinal, 25-30% of femoral, 15-20% of umbilical and 3-5% of incisional herniæ get strangulated
- (12) Strangulated inguinal hernia preponderates in males 8 1
 " femoral " " " females 4 1
 " umbilical " " " " 6 1
- (13) Never allow the septic fluid from the strangulated hernial sac to run into the peritoneal cavity or soak into the surrounding cellular tissues

- (a) *Never relieve the constriction before draining the sac*
 - (b) *Never drain the sac before protecting the wound margins by towels*
- (14) *Always be sure of perfect hæmostasis before allowing the omental stump to recede Always transfix the omentum*
 - (15) *Persistent constriction mark after recovery of the whole strangulated loop Invaginate the ring, but expect stricture as a sequela*
 - (16) *Free omental grafts live except in the presence of gross infection*
 - (17) *Always keep hæmostats on both the edges of the uppermost limit of hernial sac incision to avoid extra peritoneal reduction of contents*
 - (18) *Sac isolation from inside is a quicker and better method in experienced hands*
 - (a) *Incision of the sac*
 - (b) *Evacuation and reduction of contents*
 - (c) *Insertion of a finger inside*
 - (d) *Dissection isolation of the sac over the finger*
 - (19) *Sac isolation from inside saves trauma to the contents as the isolation of the sac is done after their reduction*
 - (20) *'False neck' formation its closure and dealing with the distal portion of the sac later is a time saving measure*
 - (21) *Treatment of the distal sac after ligature of neck*
 - (A) *Excision*
 - (B) *Puckering obliteration of its cavity*
 - (C) *Turning inside out.*
 - (22) *Reductio en masse*
 - (a) *Strangulated hernia*
 - (b) *History of reduction by taxis*
 - (c) *Persistence of strangulation syndrome.*
 - (23) *On no account relieve the constriction of a strangulated hernia from inside the peritoneal cavity after laparotomy*
The patient is sure to die from peritonitis due to entrance of the sac fluid into the general peritoneal cavity Always open the inguinal canal and drain the sac from outside as in ordinary strangulated hernia.
 - (24) *Special conditions in strangulated hernia*
 - (A) *Richter's hernia*
 - (B) *Maydl's retrograde*
 - (C) *"*
 - (D) *"*
 - (25) *Gut above the constriction more unhealthy than the gut below = Maydl's retrograde strangulation*

- (26) *Points about strangulation :*
 (A) *Inguinal strangulation most frequently met with*
 (B) *Femoral strangulation most frequent complication*
 (C) *Umbilical strangulation most serious*
- (27) Valuable signs in the diagnosis of strangulated hernia
 (a) Increased peristalsis on abdominal auscultation
 + (b) Tenderness over an hernial aperture
- (28) Post operative dangers of strangulated umbilical hernia
 (a) Shock
 (b) Paralytic ileus
 (c) Chest complications
- (29) Richter's strangulation is most common in femoral hernia
- (30) Grey, sodden patches with complete loss of resilience and faeculent smelling fluid are conclusive proofs of gangrene
- (31) Free omental grafts are better than pedicled omental grafts for covering the gangrenous bowel
- (32) Some rare contents of strangulated hernial sac
 (a) Twisted ovary and tube
 (b) Twisted testis
 (c) Gangrenous appendix
 (d) Meckel's diverticulum
 (e) Bladder diverticulum
- (33) *Aids to reduction of intestines into the peritoneal cavity*
 (a) *Trendelenburg posture*
 (b) *Good anaesthesia* relaxation of parietes
 (c) Elevation of wound margins
 (d) *Deep respirations*
 (e) *Methodical gradual manipulations from one end*
 (f) Cannula evacuation if distension +
- (34) *Limit of safety in novocain anaesthesia is*
 (a) 100 ccs of 1 %
 or (b) 250 ccs of 5 %
- (35) Differential diagnosis between
 (a) Strangulated femoral hernia
 (b) Suppurating gland of Cloquet
- (36) Attention to skin is very important, in strangulated umbilical hernia, if virulent cellulitis is to be avoided
- (37) *Although division of Poupart's ligament may not weaken the abdominal wall, it is better to avoid it as far as possible*
- (38) Treatment of intestines in strangulated hernia
 (A) If safe
 . Return

- (B) If doubtful
 - (a) Wait and see
 - (b) Exteriorize the loop
- (C) If gangrenous
 - (a) Local purse string and bury
 - (b) Constriction ring invaginate
 - (c) Regional
 - (1) Condition good
Resection + anastomosis
 - (2) Condition bad
 - (a) Resection + Paul's drain in each end
 - or (β) Proximo lateral anastomosis
With exteriorization of the loop
 - (3) Condition hopeless
Proximal enterostomy
With exteriorization of the loop
- (39) *Catheterisation is an important part of pre operative preparation of strangulated hernia*
- (40) If a hernial sac is much adherent to the surroundings make a 'false neck' by cutting all round at the neck and closing it with purse string. Leave alone the distal part or turn it inside out
- (41) Fascial hernioplasty is out of question after strangulated herniotomy
- (42) Strangulated hernia in infancy
 - (a) Taxis in 'Judgement of Solomon' posture
 - (b) Point of obstruction
 - (α) External ring in more than half the cases
 - (β) Sac constriction at the int. ring
 - (c) Removal of the sac is enough no hernioplasty
- (43) *Midline sub umbilical incision is the most common cause of strangulated incisional hernia*
- (44) In post operative peritonitis after strangulated herniotomy, hope lies in immediate laparotomy, dealing with the cause and drainage.
- (45) Avoid narrowing of lumen by purse string action of continuous suture by using separate catgut for four layers of suture in end to-end anastomosis of small gut
- (46) In lateral anastomosis stumps must be securely invaginated and fixed to adjacent limbs of anastomosis ends being turned in against the intestines
- (47) Wilkie's technique in high resections
Contents of proximal intestine are carried on into distal by a rubber tube joining both the Paul's tubes, fixed on to the ends.

- (48) *The viscera drawn down along with an inguinal hernial sac are*
 (a) *The bladder*
 (b) *The cæcum*
 (c) *The left or iliac colon*
- (49) *Inspection should never be omitted in the examination for a hernia Small hernias are better seen than felt*
- (50) *Majority of rounded translucent swellings in the inguinal canal are encysted hydroceles of hernial sacs.*
- (51) *Translucent rounded swelling in the inguinal canal*
 (a) *Hydrocele of the cord*
 (a) *Congenital*
 (β) *Infantile*
 (γ) *Encysted*
 (b) *Hydrocele of the hernial sac.*
- (52) *The main avoidable causes of recurrence after herniotomy are*
 (a) *Hæmatoma*
 (b) *Suppuration*
 (c) *Untreated etiology*
 (d) *Incomplete convalescence*
- (53) *Commonest sources of trouble after herniotomy*
 (a) *Hæmatoma of the scrotum*
 (b) *Retention of urine*
- (54) *Inguinal canal is a muscular sphincter with active contraction when abdominal pressure rises*
- (55) *Treatment of inguinal hernia*
 (1) *Hernia of infancy*
 (A) *Truss for one to four years*
 ↓ (B) *Simple herniotomy*
 Without division of ext oblique
 (2) *Hernia between 4-12 years*
 Andrews's non transplantation or submuscular cord
 (3) *Hernia after 12 years*
 Bassini with superimposition of ext oblique
 (4) *Large, recurrent hernia with weak muscles*
 Gallie's fascial graft
 (5) *Direct inguinal hernia*
 (a) *Rectus flap of Bloodgood*
 (b) *Gallie's fascial graft*
- (56) *Indications in hernial operations*
 (A) *Herniotomy*
 Early hernia without primary or secondary weakness of inguinal canal
 (B) *Herniorrhaphy musculo fascial adjustment*
 Moderate hernia with slight weakness of inguinal canal

- (a) Unilocular
- (b) Multilocular
- Operate as early as possible
- (71) *Etiology of hernia*
 - A pouch of peritoneum may be forced out by excessive prolonged or oft repeated intra abdominal pressure
 - (a) Wherever vessels or nerves pass out
 - (b) Wherever muscles arise or are inserted
 - (c) Wherever fibrous intersections or septa occur
- (72) Sutures through recti muscles unless they are approximating ones without any tension do more harm than good
- (73) Strangulated incisional hernia
 - Signs of complete obstruction are masked Conservatism spells disaster Operate early
- (74) Strangulated obturator hernia
 - (a) Partial or complete intestinal obstruction
 - + (b) Pain radiating to the inner side of the knee
- (75) *Every doubtful gluteal swelling should be subjected to open exploration and never to aspiration*
- (76) *Two clinical forms of hernia*
 - (a) Sudden with strangulation
 - (b) Gradually progressive
- (77) *Most common causes of recurrence in hernia*
 - (a) Sepsis
 - (b) Strain
- (78) *Complications of hernia*
 - (a) Irreducibility
 - ↓ (b) Incarceration
 - ↓ (c) Obstruction
 - ↓ (d) Inflammation
 - ↓ (e) Strangulation
- (79) Remember respiratory and intestinal complications after every operation on ventral hernia
- (80) Never undertake a laparotomy lightly in
 - (a) Child bearing women
 - (b) Laborious occupations
- (81) *Never take continuous stitches in the abdominal parietes if you want to avoid*
 - (a) Burst abdomen
 - (b) Ventral hernia
- (82) *After every laparotomy*
 - (1) Avoid straining of any kind for at least a year
 - (2) Abdominal support for 6 months
 - (3) Sterilisation wherever possible
 - In women with low laparotomy

- (83) Gallie's fascial hernioplasty is best in
- (a) Assured aseptic technique
 - (b) Large hernias
 - (c) Ventral hernias
 - (d) Direct inguinal hernias
 - (e) Recurrent hernias
 - (f) In absence of strangulation
- (84) *Beware of trauma to the intestines in scar hernias at the time of opening the sac*
- (85) *Do not operate in hernias which are secondary to non removable strain, unless operation is forced by strangulation*
- Main contra indications are
- (a) Chronic respiratory strain
 - (a) Chronic bronchitis and bronchiectasis
 - (β) Asthma
 - (b) Chronic inveterate constipation
 - (c) Irremovable urinary obstruction
- (86) *In every hernia, remove the cause of straining, before or at the time of herniotomy*
- (87) *Hernia in a child examine the prepuce.*
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CHAPTER IX

THE LIVER

(I) CONGENITAL AFFECTIONS:

(1) RIEDEL'S LOBE

- Def Linguiform process attached to the right lobe of the liver
 Path May be associated with gall stones
 Clinic Mobile can be pushed beyond midline
 Diff diag (1) Mobile kidney
 (2) Gall bladder

(2) CORSET LIVER

- Def Transverse furrow into the liver
 Etio Tight corset in females
 Clinic (a) Palpable furrow
 (b) Pedicled mobile part
 Compl Torsion of the pedicle

(3) HEPATO PTOSIS

- Def Displacement and undue mobility of the liver
 Due to laxity of its ligaments
 Etio (1) Congenital
 (2) Acquired
 Path (a) Dislocated liver partial displacement
 (b) Wandering liver free mobility
 Compl (1) Association with visceroptosis
 (2) Torsion
 (3) Drag on surrounding viscera
 Clinic (a) Gastro intestinal syndrome
 (b) Respiratory syndrome
 (c) Cardiac syndrome
 (d) Portal pressure syndrome
 (e) Biliary syndrome
 Signs (1) Palpation
 (2) X Rays
 Treat (1) Conservative—supports
 (2) *Hepatopexy*

(4) CONGENITAL CYSTIC DISEASE

(See cysts of the Liver)

(II) TRAUMA:

(1) CLOSED TRAUMA

- Def Injury to liver without breach of skin
 Cause Sudden severe blow against the hepatic region
 Path (A) **Contusion**
 (B) **Laceration**

Effects : (a) **Hæmorrhage :**

- (α) Central
- (β) Sub capsular
- (γ) Peritoneal

(b) **Secondary infection :**

- Traumatic hepatic abscess

(c) **Aseptic irritative serositis :**

- (α) Peritonitis
- (β) Pleurisy

Clinic . (1) History of trauma

(2) Shock

(3) **Local signs :**

- (α) Pain
- (b) Tenderness
- (c) Rigidity
- (d) Associated fracture ribs • if any

(4) **Internal hæmorrhage syndrome :**

- (α) General rapid anæmia
- + (b) Free fluid in the peritoneum

Sp. signs . (1) **Bradycardia :**

- : Due to absorption of bile

(2) Irritative peritonitis with icterus :

- If hæmoperitoneum

Compl : (1) **Associated fracture ribs**

(2) **Associated visceral injuries**

(3) **Hæmorrhage : Internal**

- (α) Primary
- (b) Secondary

(4) **Irritative inflammations :**

- (α) Peritonitis
- (b) Pleurisy

(5) **Secondary infection :**

- (α) Hepatic abscess
- (b) Subdiaphragmatic abscess

(6) **Pulmonary embolism**

Treat (A) **Conservative :**

Ind : (α) No serious symptoms

(b) Too serious condition

Tech . (1) Absolute rest

(2) Morphia

(3) Blood coagulants

(4) Local ice

(5) Blood transfusion

(B) **Operative :**

Ind : (α) Progressive symptoms

(b) Internal hæmorrhage

(c) Peritonitis

Tech : (See under *Operation*)

(2) OPEN TRAUMA

Def	Injury to the liver by a penetrating agent
Etio	(a) Stab wound (b) Gunshot wound (c) Impalement
Path	(1) Uncomplicated (2) Complicated Associated visceral injuries
Clinic	(1) Hæmorrhage (a) External (b) Internal (2) Presence of a wound in hepatic region
Compl	(a) Hæmorrhage (b) Associated visceral injury (a) Pleura and lung (β) Stomach, colon, intestines (γ) Gall bladder (c) Infection (d) Bile peritonitis
Treat	Operative exploratory laparotomy (See under Operations)

(III) ACUTE SURGICAL INFECTIONS.

LIVER ABSCESS

- Etio (A) **Portal route** Pylephlebitis
 (a) Suppurative appendicitis
 (b) Inflamed hæmorrhoids
 (c) Diverticulitis
 (d) Inflamed carcinoma colon
 (e) Amœbic abscess
- (B) **Biliary route**
 Suppurative cholangitis
- (C) **Trauma** With infection
- (D) **Direct extension**
 (a) Subphrenic abscess
 (b) Acute cholecystitis
 (c) Perforated duodenal ulcer
 (d) Empyema
- (E) Suppurating hydatid
- (F) **Umbilical route**
 (a) Infected umbilical cord
 (b) Veins of Sappey
- (G) Lymphatics
- (H) Hepatic artery general pyæmia

- Bact : (a) *B. coli*
 (b) *Staphylococci*
 (c) *Streptococci*
 (d) *Amoebæ*

(A) PYLEPHLEBITIS WITH PORTAL PYÆMIA

Def. Septic portal phlebitis with septic embolism in the liver, leading to multiple hepatic abscesses, primary focus being in the alimentary canal

- Etio (1) Suppurative or gangrenous appendicitis
 (2) Inflamed hæmorrhoids
 And their hasty operative treatment

Morb. anat Liver riddled with small, multiple abscesses
 Honeycomb abscesses

Site Right lobe

- Clinic (1) Presence of primary focus
 (2) Septicæmia
 (a) Rigors
 (b) High swinging temperature
 (3) Painful, tender, enlargement of liver
 (4) Icterus

- Diagnosis (1) Rigors with fever
 (2) Tender liver
 (3) Primary focus

- Diff diag (A) Subphrenic abscess
 (B) Acute cholecystitis
 (C) Charcot's intermittent fever
 Obstructive cholangitis

Treat (A) Prophylactic :

- (1) Avoidance of
 (a) Operation on inflamed piles
 (b) Meddlesome appendicectomy
 (a) Injury to abscess wall
 (β) Injury to œdematous omentum

(2) Ligature of ileo-colic vein :

Ind Early rigors in acute appendicitis

- Steps (A) Ligature of ileo-colic vein
 2" from ileo-cæcal junction
 ↓ (B) Appendicectomy

(3) Intravenous :

- (a) Mercurochrome
 (b) Colloidal iodine
 (c) Prontosil group

(B) Curative

- (1) Intravenous therapy : (See above)

(2) Exploration → drainage

(a) Abscess

(b) Costo hepatic space

Tech (a) Laparotomy

(b) Feel for elevation + induration

(c) Pack off the area

(d) Aspirate

(e) Insert sinus forceps

(f) Drain

(α) Transcostal

(β) Abdominal through the omentum

After treat Semi Trendelenburg position

(B) SUPPURATIVE CHOLANGITIC ABSCESSES

Def Multiple abscesses in the liver secondary to septic obstructive cholangitis

Etio **Obstruction of biliary passages** due to

(a) Impacted stone

(b) Stricture

(c) Growth

(d) Pancreatic lesions

(α) Chronic pancreatitis

(β) Carcinoma pancreas

Path (1) Biliary stasis → cholæmia + enlarged liver

+ (2) Secondary infection → septic toxæmia

Morb anat Multiple abscess cavities containing septic bile

Clinic (1) **Primary biliary obstruction**

(a) Jaundice obstructive

(b) Enlargement of liver

(c) Presence of primary cause of obstruction

↓ (2) **Septic phenomena** Super added

(a) Charcot's intermittent fever

(b) Pain and tenderness over the liver

(c) Toxæmia

Compl (1) Septicæmia

(2) Cholæmia

Diff diag (1) **Portal pyæmia**

(a) Presence of primary focus

(b) Jaundice late and less

(2) **Cirrhosis liver**Treat (1) Cholecystostomy } after removal of
(2) Choledochostomy } obstruction**(C) TROPICAL OR AMŒBIC ABSCESS**

Etio Amœbiasis

Amœbic dysentery

Site Right lobe

- Path : (1) Amœbic dysentery (ulcers)
 ↓ (2) Amœbæ in portal radicles
 ↓ (3) Amœbic hepatitis
 ↓ (4) Amœbic hepatic abscess
- Morb anat. (a) Solitary, extensive
 (b) Liquified necrosis of liver parenchyma :
 Sterile, chocolate-coloured contents
 (c) Irregular or lobulated cavity
 (d) Shaggy wall
- Clinic (1) Tropical habitat
 (2) History or no history of **dysentery**
 (3) **Septic toxæmia** :
 (a) Sthenic intermittent or remittent fever
 (b) Asthenic cachexia with icterus
 (4) **Inflammatory enlargement of liver** :
 Pain + tenderness + rigidity
 (5) **Basal thoracic signs**
 ↓ (6) **Local tender swelling** :
 (a) Hypochondriac or epigastric
 (b) Lateral costal
 (c) Posterior costal
 ↓ (7) Pointing subcutaneous abscess in late cases
 (a) Abdominal wall
 (b) Costal
- Special signs (1) **Hepatic cachexia** :
 (a) Greyish yellow colour
 (b) Icteric scleræ
 (c) Wasting
 (2) **Stool examination** :
 Amœbic cysts
 (3) **X-Ray** :
 Diaphragm raised and immobile
 (4) **Blood** :
 Leucocytosis without marked polymorphosis
 (5) **Aspiration** :
 : Chocolate-coloured fluid
- Diff. diag (1) **Fevers** : Malaria
 (2) **Hepatic conditions** :
 (a) Amœbic hepatitis emetine test
 (b) Cirrhosis liver
 (c) Acute infections of the liver
 (3) **Regional conditions** :
 (a) Subphrenic abscess
 (b) Cholecystitis
 (c) Peri gastric abscess

Diff diag between syphilis liver and carcinoma liver

Signs	Syphilis	Carcinoma
Age	20-50	Over 50
General health	Good	Cachexia & asthenia
Tenderness	Absent	Local
Ascitis	Absent	Present
Spleen	Enlarged	Not enlarged

Treat Of syphilis liver

Anti syphilitic except arsenic

(3) **ACTINOMYCOSIS**

Syn Honey-comb liver

Routes (1) Portal Secondary to ileo-caecal region

(2) Haematogenous From neck focus

(3) Direct extension From pleura and lung

Morb anat Honey-comb abscesses

Clinic Hepatic abscess syndrome

Treat 10-30 minims of fresh tr iodine in 2 ounces of milk

T D S

(V) CIRRHOSIS OF THE LIVER:Eti (A) **Portal toxæmia:**

Cause Alcoholism

Clinic Atrophic cirrhosis with ascitis

(B) **Biliary cirrhosis:**

Causes (a) Calculous obstruction

(b) Suppurative cholangitis

Clinic Enlargement of liver with jaundice

(C) **Splenic cirrhosis:**

Cause Primary splenic toxæmia

Clinic (a) Primarily enlarged spleen

(b) Liver enlargement late

(c) Jaundice variable

(D) **Specific cirrhosis:**

Cause Syphilis

(a) Congenital

(b) Secondary

(c) Tertiary

Clinic Enlargement → atrophy of liver with

(a) Ascitis

or (b) Jaundice

or (c) Enlarged spleen

or (d) Hæmatemesis or bleeding piles

- Diff. diag: (1) **Hepatic abscess or cyst**
 (2) **Carcinoma: Secondary**
 (3) **Hepatic displacement:**
 : Subphrenic abscess
 : Empyema
 (4) **Hepato-ptosis**

- Treat: (A) **Portal: (In suitable cases)**
 (a) **Talma-Morison**
 (b) **Paterson**
 (c) **Wynter** } : (See under Operations)
 (B) **Biliary:**
 : Early biliary drainage
 : (Cholecystostomy or choledochostomy)
 (C) **Splenic:**
 : Splenectomy
 (D) **Specific:**
 : Anti-syphilitic treatment

(VI) TUMOURS:

- (A) *Innocent:*
 (1) **Angioma:**
 : Cavernous hæmangioma
 : Small and silent
 (2) **Adenoma: Hepatoma**
- (B) *Malignant:*
 (1) **Carcinoma:**
 (a) **Primary:** rare
 Etio: Cirrhosis
 (b) **Secondary:**
 Etio: (1) **Extension from neighbours:**
 (a) Gall bladder
 (β) Pylorus or cardia
 (2) **Metastatic:**
 : From alimentary canal:
 (a) Stomach
 (b) Rectum
 (c) Sigmoid
 (d) Cæcum
 : From other organs
 Clinic: (1) **Enlargement of the liver: extreme**
 (a) Irregular
 (b) Bossy:
 : **Umbilicated multiple growths**
 (2) **Cachexia**
 (3) **Jaundice: 60%**
 (4) **Ascitis: 58%**
 Sign: **Exploration or peritoneoscopy**

- (B) Bleeding haemorrhoids
Injection treatment
- (C) Ascitis
- Ind (a) Alcoholic cirrhosis no syphilis or malignancy
(b) General good condition
(c) No cardiac hepatic or renal failure
(d) History of more than a year
With repeated tapings
- 're oper (1) Estimation of function
(a) Liver
(b) Heart
(c) Kidneys
(2) Administration of
(a) Glucose
(b) Blood coagulants if jaundice
- Anæsth Local novocain
- Methods (A) Anastomosis between portal and systemic veins
Omentopexy Fixation of omentum into
(a) Extra peritoneal space
or (b) Retro rectus space
Between muscle and sheath
or (c) Subcutaneous space
- (B) Constant extra peritoneal drainage
(1) Glass bobbin method Paterson
(2) Silk strands method
(3) Peritoneo-cellular fistula Wynter
Opening peritoneum into Scarpa via femoral canal
(4) Transplantation of saphenous vein into peritoneum
- (C) Excision of toxic focus
Splenectomy if splenomegaly
- Technique *Of Talma Morison operation for ascitis*
(1) Incision (a) Median epigastric (Omentopexy)
(b) Supra pubic (Drainage)
(2) Scrubbing of (a) Liver
(b) Spleen
(c) Diaphragm
(3) Fixation of spread out omentum to
(a) Post surface of rectus sheath
or (b) Between the sheath and muscle
or (c) Subcutaneous space
(4) Fixation of omentum to peritoneal incision
During its closure
(5) Supra pubic glass tube drain
(6) Closure
- After treat (a) High Fowler's posture
(b) Drainage tube
(a) Change glass for rubber
4th day

(β) Remove the drain
10th day

(c) Plenty of glucose and fluids

Post compl (1) Hepatic failure and cholemia

(2) Pulmonary complications

(3) Uræmia

(4) Cardiac failure

Sequelæ (a) Recurrence

(b) Ventral hernia

(IX) IMPORTANT POINTS

- (1) *Bradycardia is an important sign in bile extravasation and absorption*
 - (a) Jaundice
 - (b) Perforation of gall bladder
 - (c) Trauma to the liver
- (2) Diagnose acute yellow atrophy of the liver from surgical liver by early and rapid shrinking
- (3) Swinging temperature with rigors in the course of acute appendicitis denotes pylephlebitis with portal pyæmia.
- (4) *If the hand can be passed between the liver and the diaphragm, the existence of a subphrenic abscess can be eliminated at once*
- (5) *Do not enlarge by insertion of finger and do not try to break down the loculi in liver abscess, as it will produce bleeding*
- (6) In amœbic abscess of the liver
 - (a) History of dysentery in 60%
 - (b) Amœbæ in stools in 36%
 - (c) Amœbæ in liver pus in 17%.
- (7) *The needle can be diagnosed to be in the liver when it oscillates with respiration*
- (8) Age in liver affections
 - (a) Syphilis 20-50
 - (b) Carcinoma above 50
- (9) When jaundice is present blood serum may give a positive Wassermann even in the absence of syphilis
- (10) Syphilis of the liver
 - (a) Single or multiple, localised rounded non umbilicated nodules
 - (b) Irregularly lobulated liver
- (11) *Liver gummata rarely soften, testicular gummata always soften*
- (12) Most common causes of liver enlargement
 - (a) Cirrhosis
 - (b) Nutmeg liver

- (c) *Amœbic hepatitis or abscess*
- (d) *Biliary obstruction*
- (e) *Secondary carcinoma*
- (13) *Most common cause of hæmatemesis is liver cirrhosis*
- (14) *Amœbic abscess of the liver*
 - (a) *Explore 8th or 9th inter costal space in mid-axilla*
 - (b) *Needle oscillates with respiration*
 - (c) *Try in different directions*
 - (d) *Withdraw rapidly*
- (15) *Chocolate coloured pus is pathognomonic of amœbic liver abscess*
- (16) *In any kind of liver enlargement do not forget syphilis*
- (17) *Ultimate result of omentopexy for ascitis is not encouraging many cases die of hepatic failure*
- (18) *Secondary carcinoma of the liver, examine for a primary*
 - (a) *Stomach*
 - (b) *Rectum*
 - (c) *Sigmoid*
 - (d) *Cæcum*
 - (e) *Gall bladder*
- (19) *Turpentine or iodoform pack for hepatic lacerations, Formalin pack for hydatid cyst*
- (20) *Nodular liver*
 - (a) *Late cirrhosis*
 - (b) *Secondary carcinoma*
 - (c) *Gummata*
- (21) *Basal chest complications are extremely frequent in liver infections, reverse is rarely true*
- (22) *Beware of the patient with a glass eye and an enlarged liver ? Secondary uveal melanoma.*
- (23) *Most common infections of the liver*
 - (a) *Amœbic hepatitis and abscess*
 - (b) *Suppurative cholangitis*
 - (c) *Portal pyæmia*
- (24) *Stab wounds over the hepatic area must always be explored, tamponaded and sutured*
- (25) *Ligature of the main hepatic artery is followed by necrosis liver*
- (26) *In every enlargement of the liver, examine*
 - (a) *The heart*
 - (b) *The spleen*
 - (c) *Peritoneal free fluid*
 - (d) *Feet for œdema*
 - (e) *Face for jaundice*

- (27) Acute suppurative conditions round about the liver
- Subphrenic abscess
 - Perigastric abscess
 - Perinephric abscess
 - Basal empyema
- (28) Signs of tropical abscess of the liver may be
- Sthenic
 - Asthenic
- (29) *Every subcutaneous abscess over the right hepatic area and epigastrium suspect hepatic abscess*
- (30) Cirrhosis liver
- Not very painful
 - Spleen enlarged
 - Venous prominence
 - History of hæmatemesis or bleeding piles
 - Ascitis 50% of late cases.
- (31) *Patient with a syphilitic liver is rarely jaundiced or rarely has ascitis*
- (32) Excessively large spleen is more in favour of splenic anæmia than of primary liver cirrhosis
- (33) Syphilitic liver is very lumpy and irregular and resembles carcinoma liver but it rarely produces clinical symptoms
- (34) Syphilis liver
- Age younger than cancer
 - No clinical syndrome
 - Other stigmata present
- (35) *Commonest tumour of the liver is secondary carcinoma, 90% of the primaries being in the portal area*
- (36) Hepatic carcinoma is most common between 40 and 70 and is unknown before 22
- (37) There is no other disease than secondary carcinoma, in which such a huge liver may be found
- (38) Umbilication is pathognomonic of hepatic carcinoma
- (39) Not all livers enlarged from malignant disease have palpable nodules.
- (40) By far the most frequent cause of long standing jaundice is cancer of the liver, which produces a deeper yellow discolouration of the skin, which goes on to olive green and grey
- (41) *In cirrhosis*
- There are no
- Clay coloured stools
 - Enlarged gall bladder
 - Intense jaundice.
- (42) *Jaundice from gall stone impaction fluctuates, jaundice due to cancer is progressive and permanent*

- 43) Rounded, smooth, regular, big, cystic tumours in the abdomen, neither painful nor tender
- (a) Ovarian cyst
 - (b) Hydatid cyst
 - (c) Mesenteric cyst.
- (14) It is excessively rare for hydatids to cause pressure symptoms
-

CHAPTER X

THE GALL BLADDER AND BILE DUCTS

(I) CONGENITAL AFFECTIONS:

(A) ABNORMAL GALL BLADDER.

- (1) Absence
- (2) Misplacement: Transposition
- (3) Duplication
- (4) Hourglass contraction
- (5) Embedded: In liver
- (6) Mobility → Torsion.

Clinic (a) Elderly females
 (b) Acute pain + tenderness + spasm
 (c) Enlarged gall bladder
 (a) Coming up in a few hours
 (b) Appearing and disappearing

Treat Cholecystectomy

(B) ABNORMAL BILIARY DUCTS

- (1) Cystic duct: (a) Absent
 (b) Very short
 (c) Very long
 (d) Spiral
- (2) Hepatic ducts: (a) Accessory
 (b) Abnormal course
- (3) Common duct obliteration.

Time End of 2nd week to end of 2nd month

Clinic (a) Persistence of jaundice after 2nd week
 (b) No bile in stools
 (c) Bile in urine

Diff diag (1) Icterus neonatorum
 (a) Disappears within two weeks
 (b) Bile present in stools
 (2) Haemolytic sepsis
 (3) Congenital syphilis

Treat Explore → short circuit

(4) Common duct cyst

Syn Choledochus cyst

Etio Adolescent females

Site Between the junction and the duodenum

Path (a) Achalasia

↓ (b) Obstructive

- Clinic** (1) Cystic tumour : In right hypochondrium
(2) Biliary obstruction : jaundice
(3) Duodenal obstruction
(4) X Rays :
(a) Barium meal - displacement
(b) Cholecystography : 'Comma' gall bladder
- Compl :** (a) Obstructive jaundice
(b) Biliary sepsis - cholangitis
(c) Biliary cirrhosis
(d) Rupture bile peritonitis
- Treat** (1) Exploration
↓ (2) Excision
↓ (3) Reconstruction around a tube

(C) ABNORMAL BLOOD VESSELS.

- (1) **Right hepatic artery :**
Anterior transposition
- (2) **Cystic artery :**
 - (a) Anterior transposition
 - (b) Variable origin
 - (c) Accessory artery
- (3) **Plexiform veins**

(II) TRAUMA:

(1) GALL BLADDER

- | | | | |
|---------------|-----|--|------------------------|
| Etio. | (a) | Subcutaneous ruptures: | Run over accidents |
| | (b) | Stab wounds | |
| Clinic: | (a) | Traumatic shock | |
| | (b) | Bile peritonitis | |
| | (c) | Septic peritonitis | |
| | (a) | Local | |
| | (β) | Spreading | |
| Special signs | (1) | Slow pulse | |
| | (2) | Jaundice with wasting | |
| Treat | (1) | Exploratory laparotomy | |
| ↓ | (2) | Treatment of the focus | |
| | (A) | Basal part | cholecystectomy |
| | (B) | Fundal part | |
| | | Purse string cholecystostomy | |
| ↓ | (3) | Peritoneal toilet | |
| ↓ | (4) | Closure with drainage of Morrison pouch | |

(2) BILIARY DUCTS

- Etio (a) Accidental
 (b) Post-operative : Cholecystectomy
 Path Common operative injuries :
 (1) Blood-vessels :
 (a) Cystic artery : (a) Retraction
 (b) Slipped ligature

- (b) Right hepatic artery inadvertent ligature
(c) Portal vein needle prick or tear
- (2) **Ducts :**
- (a) Right hepatic duct : inadvertent ligature
(b) Common hepatic duct : button holing
(c) Common bile duct . button holing
 • clamping
- (3) **Duodenum .** Accidental perforation
- Clinic (A) **Immediate :** Operative diagnosis
(B) **Delayed :** (a) Biliary fistula post operative
 (b) Jaundice obstructive
- Compl. Peritonitis
- Sequela Stenosis with (α) Jaundice
 (β) Biliary fistula
- Treat (A) *Prophylactic*
- (1) Demonstrative dissection of three duct junction
(2) Division of cystic duct as near the gall bladder as possible
(3) Careful cutting of adhesions
(4) Blood vessels
 (a) Never clamp before identification
 (β) Never cut before clamping
- (B) *Curative . Immediate*
- (1) **Blood-vessels :**
 (a) Hogarth Pringle technique
 (b) Lateral ligature for portal vein
- (2) **Ducts :**
 (a) End to end anastomosis over a tube
 (b) External drainage
 (c) Ligature with cholecyst enterostomy
- (C) *Delayed Of sequelæ*
- Bile duct reconstruction
- (1) End to end anastomosis after excision
(2) Choledocho-duodenostomy
(3) Hepatico-enterostomy
(4) Wilm's tube reconstruction method
(5) Walton's duodenal flap method
(6) Implantation of fistula in alimentary canal
(7) Cholecyst enterostomy
(8) Dilatation or incision of stricture

(III) INFECTIONS OF THE BILIARY APPARATUS:

- Path (A) *Routes of infection*
 (1) Portal circulation
 (2) **Systemic circulation** : Intramural sepsis

- (3) **Biliary passages :** Septic cholangitis
 - (a) Liver
 - (b) Duodenum
 - (c) Pancreas
- (4) **Lymphatics :** Primary lesions
 - (a) Stomach
 - (b) Duodenum
 - (c) Pancreas
 - (d) Ileo cæcal : appendix
- (5) Direct extension : hepatitis
- (B) *Pathological varieties :*
 - (a) **Acute :**
 - (α) **Catarrhal :**
 - Varieties : (1) Catarrhal
 - (2) Suppurative
 - (3) Ulcerative
 - (4) Perforative
 - (5) Gangrenous
 - (β) **Obstructive :**
 - Causes : (1) Torsion
 - (2) Obstruction . (α) Lumen
 - (β) Walls
 - (γ) Outside
 - Morb. anat . (1) Hydrops
 - (2) Empyema
- (b) **Chronic :**
 - (α) **Intra-mural :** Streptococcal
Infection *via* systemic circulation
 - (β) **Infected cholesterosis :**
 - Varieties (1) Strawberry gall bladder
 - ↓ (2) Papillomatous gall bladder
 - Path : Hepatitis
 - ↓ Less bile acid content
 - ↓ (a) **High bile-cholesterol content :**
 - ↓ More cholesterol absorption
 - ↓ (b) **Altered cholesterol chemistry :**
 - ↓ Prevention of its transport
 - ↓ Accumulation in muc mem
 - Morb. anat Deposition of cholesterol in muc. mem
 - (γ) **Gall stones :**
 - Cholecystitis + cholelithiasis
 - (δ) **Septic bile :**
 - Septic cholangitis

(C) *Pathological factors*

- (1) **Infection** : Hæmatogenous
- (2) **Obstruction** : Stones, stenosis
- (3) **Irritation** : Stones
- (4) **Stasis** : Biliary

(D) *Bacteriological varieties.*

- (1) **Hæmatogenous** : Streptococcal
- (2) **Biliary**
 - (a) B Coli
 - (b) B Typhosus
 - (c) Cl Welchii

(1) **ACUTE CHOLECYSTITIS**

Etio. (a) **Acute catarrhal infection**

(b) **Acute obstruction + sepsis**

(a) **Torsion**

(β) **Stone impaction**

(c) **Acute biliary sepsis**

Clinic. (1) *Local signs of acute inflammation*

(a) **Pain**

(b) **Tenderness** :

(a) **Tip of the 9th cartilage**

Carmalt Jones

(β) **Gall bladder area**

(γ) **Right hypochondrium**

(c) **Rigidity** : **Right hypochondrium**

(d) **Murphy** : **Catch in breath**

(e) **Gall bladder** + or -

(2) *Referred signs*

(a) **Shoulder girdle pain**

(b) **Boas** :

Epicritic hyperæsthesia between

11 D and 1 L spines

(c) **Hiccough**

(3) *General signs* **septic toxæmia**

Diagnosis (1) **History or no history of biliary trouble**

+ (2) **Acute right hypochondritis**

Diff diag (A) *Other causes of acute abdomen*

(a) **Gastric or duodenal perforation**

(b) **Acute appendicitis**

(c) **Acute pancreatitis**

(d) **Acute hepatic abscess**

(B) *Acute extra peritoneal causes*

(a) **Acute pyelitis**

(b) **Pyonephrosis**

(c) **Acute torsion of the kidney**

(C) *Extra abdominal causes.*

(a) **Pleurisy or empyema or pneumonia**

(b) **Pott's disease of the spine**

(D) General causes

- (a) Septic fevers
- (b) Specific fevers
- (c) Tabetic crises

Compl. (1) Empyema of the gall bladder :

Path Impaction in the cystic duct + infection

- Clinic**
- (a) Pain
 - (b) Tenderness
 - (c) Palpable swelling
 - (d) High remittent or intermittent pyrexia
 - (e) Leucocytosis > 15000

- Treat**
- (A) Cholecystostomy
 - (B) Cholecystectomy

(2) Perforation of the gall bladder

- Etio**
- (a) Acute cholecystitis
 - (b) Typhoid and para typhoid gall bladder

- Clinic**
- (A) Acute general peritonitis
 - (B) Sub acute
 - (a) Local peritonitis
 - ↓ (b) Peritoneal abscess
 - (C) Chronic internal biliary fistula

- Diff diag**
- (1) Acute abdomen
 - (2) Basal thoracic lesions

Special sign **Bradycardia :** Due to bile absorption

- Treat**
- (1) Exploration
 - ↓ (2) Cholecystostomy
 - ↓ (3) Drainage of the abscess
 - ↓ (4) Drainage of peritoneal cavity

(3) Gangrene of the gall bladder**(4) Cholangitis****(5) Suppurative pylephlebitis**

Treat Of acute cholecystitis

(I) Expectant :

- Ind**
- (a) Mild local attack
 - (b) Acute cholecystitis seen after 48 hours
 - (α) Stationary signs
 - (β) Receding signs
 - (c) Preoperative preparation
 - (d) Complications + bad condition

Tech (A) **Give .**

- (1) Rest in bed in Fowler position
- (2) Morphia S O S
- (3) Complete starvation for 36 hours
- (4) Local heat

- (5) Intravenous :
 - (a) Saline with glucose
 - (b) Cylotropin :
 - : 5 c cs. once a day for 3 days
 - : Then on alternate days
- (6) Oral :
 - Glucose, soda-bi carb, fluids

(B) Avoid :

- (1) Purgatives
- (2) Enemata
- (3) Local examinations

(C) Keep :

- (1) Chart of :
 - (a) Pulse
 - (b) Temperature
 - (c) Respirations
 - (d) Local condition
 - (e) Jaundice
- (2) Examination reports of
 - (a) Urine
 - (b) Stools
 - (c) Blood
 - (d) Chest

(II) Operative :

- Ind (a) **Acute cholecystitis :**
 - : Seen within 48 hours
- (b) **Failure of conservatism :**
 - (a) Persistence of acute local signs
 - (b) Persistence of acute toxæmia
 - (r) Rising leucocytosis > 20000
- (c) **Uncertain diagnosis**

Tech (1) Cholecystostomy**(2) Cholecystectomy :**

Ind Within 48 hours of acute attack

Contraind Jaundice

(2) CHRONIC CHOLECYSTITIS

- Etio (a) **Systemic infection intra-mural streptococcal**
- (b) Infected cholesterosis
- (c) **Gall stones**

- Morb anat (1) Adhesions
- (2) Opacity and thickness of the wall
- (3) Subserous deposition of fat
- (4) Enlarged sentinel gland
- (5) Hepatitis and perihepatitis
- (6) Thick tarry bile with biliary gravel
- (7) Abnormal size

- (a) Big : (a) Hydrops
 - (β) Empyema
 - (b) Small or obliterated cavity
- (8) Internal fistulæ
- (9) Gall stones
- Clinic (1) **Silent syndrome :**
Accidental find during operation
- (2) **Septic focus syndrome :**
Typhoid gall bladder
- (3) **Alimentary syndrome :**
Flatulent dyspepsia
- (4) **Local syndrome :**
 - (a) Sub acute or chronic hypochondritis
Pain + tenderness + spasm
 - (b) Distended gall bladder
 - (c) Cholelithiasis
 - (α) Biliary colic
 - (β) Obstructive jaundice
- Signs (1) **Murphy** : (See above)
- (2) **Boas** : (See above)
- (3) **Carmalt-Jones** : (See above)
- Special signs (A) **X-Rays** : (a) Plain
 - (b) Cholecystography (Graham)
 - (c) Barium meal
- (B) Gastric test meal hyperchlorhydria
- Associations (1) **Peptic ulcer**
- (2) **Appendicitis**
- (3) **Pancreatitis**
- (4) **Gall stones**
- (5) **Hepatitis**
- Diff diag (A) *Any other cause of dyspepsia*
 - (a) **Peptic ulcer**
 - (b) Gastritis
 - (c) **Appendicitis**
 - (d) **Pancreatitis**
 - (e) **Hepatitis**
- (B) *Regional inflammations*
 - (a) Hepatitis or hepatic abscess
 - (b) Sub phrenic abscess
 - (c) **Kidney lesions**
 - (d) **Colitis**
- (C) *Various colics* .
 - (a) Biliary colic
 - (b) Intestinal colic
 - (c) Renal colic

- Compl (1) Gall stones
 (2) Obstructive jaundice
 (3) Internal biliary fistula
 (4) Carcinoma
- Treat (1) *Medical*
 (a) **Eradication of septic foci**
 (b) Treatment of obesity
 (α) Exercises
 (β) Dieting
 (γ) Thyroid
 (c) Cholesterol free diet
 Avoid eggs and butter
 (d) Cream and milk every hour
 (e) Medicinal
 (α) Hexamine R
 Hexamine grs. 100
 Soda bi carb grs 60
 Soda citras grs 60
 In water or milk T D S
 (β) Felamine Two tablets T D S
 (γ) Choleflavine
 (δ) Laxatives
 (1) Epsom salts every morning
 (2) Olive oil
 Two tablespoonfuls T D S
 (f) Injections cytotropin 5 c.cs once a day
 (α) Intramuscular
 (β) Intravenous
- (2) *Operative Cholecystectomy*
 Ind (a) Any morbid anatomy of the organ
 (b) Symptomless gall bladder
 (α) Containing stones
 (β) Acting as septic focus
 (γ) Acting as typhoid carrier
 (c) Chronic well defined syndrome
- Contraind (1) Obstructive jaundice
 With or without sepsis
 (2) Bad general condition
- (3) **CHOLANGITIS**
 Def Inflammation of biliary ducts
 Etio **Obstruction to the out flow of bile**
 (α) Impaction of a gall stone
 (β) Growth of a biliary duct
 (γ) Lesions of pancreatic head
 Path Obstruction + Infection

- † Morb anat (a) Enlarged bile stained liver
 With multiple pin head abscesses
 (b) Dilated biliary ducts
 (c) Bile stained pus
 (d) Cause of obstruction
- Clinic **Charcot's intermittent hepatic fever:**
 (a) Obstructive jaundice + enlarged liver
 ↓ (b) Complicating
 (1) **Rigors with steeple-chart fever**
 (2) **Toxæmia**
 (3) **Tender and painful liver**
- Treat **Exploration**
 ↓ **Biliary drainage.**
 (a) *Cholecystostomy*
 or (b) **Choledochostomy**
 + (c) Drainage of Morrison pouch
- Post compl. (1) Hepatic failure
 (2) Cholæmia
 (3) Septic toxæmia

(IV) TYPHOID GALL BLADDER.

- (1) Acute cholecystitis
 Perforation common
- (2) Sub-acute cholecystitis
- (3) Chronic cholecystitis
 Gall stones
- (4) Typhoid carriers
 Stool examination

Treatment Of typhoid gall bladder

- (A) **Medicinal:** Hexamine and vaccines
- (B) **Surgical** (a) Cholecystectomy
 + (b) Choledochostomy

(V) CHOLELITHIASIS:

Etio Fat, fertile, flatulent female of forty

Path (A) *Factors*

- (1) **Metabolic:**
 - (A) **Cholesteræmia:**
 - (a) Pregnancy
 - (b) Acholuric jaundice
 - (B) **Hypercalcaemia:**
 Parathyroid adenoma
- (2) **Local:**
 - (A) **Cholesterosis of gall bladder:**
 Abnormal cholesterol absorption

- (a) Strawberry gall bladder
 - ↓ (b) Papillomatous gall bladder
 - ↓ (c) Cholesterol stone
 - (B) **Biliary stasis** : Due to
 - (a) Concentration
 - (β) Obstruction
 - (C) **Infection** : Of
 - (a) The gall bladder
 - (b) The bile
 - (D) **Regurgitation of pancreatic juice** :
 - ↓ (a) Precipitation of cholesterol
 - ↓ (b) Cholesterol stone
 - (E) **Foreign body** :
 - (a) Bacteria & parasites
 - (b) Ligatures
- (B) *Types*
- (1) **Metabolic** :
 - (A) **Pure pigment stone** :

Comp	Calcium bilirubinate
Appearance	Biliary mud
	Multiple, small, gritty
 - (B) **Pure cholesterol stone** :

Comp	Cholesterol
Etio	Cholesteræmia
Path	Cholesterosis of gall bladder
Appearance	Single, medium sized or large
	Smooth or mulberry like, silent
 - (C) **Calcium carbonate stone** : (Rare)

Appearance	White, chalky
------------	---------------
 - (2) **Inflammatory** : Mixed stone

Comp.	Pigment + cholesterol + calcium
Etio	(a) Bile stasis . pigment
	+ (b) Cholesteræmia cholesterol
	+ (c) Inflammation calcium
Appearance	Multiple, faceted
- (C) *Gall stone theories*
- (1) **Metabolic theory** :
 - (a) **Cholesteræmia** :
 - (α) Pregnancy
 - (β) Acholuric jaundice
 - (γ) Diabetes
 - (δ) Arterio sclerosis
 - ↓ (b) **Cholesterosis** of gall bladder
 - (α) Strawberry
 - ✓ (β) Polypoid

↓ (c) **Gall Stones :**

- (α) Pure cholesterin
- (β) Pure pigment

(2) **Inflammatory theory :**

- (a) Infective inflammation of gall bladder
- ↓ (b) **Deposition of calcium**
- + (c) **Precipitation of cholesterin** Due to
 - (α) Less bile acids
 - (β) Diminished cholesterol absorption
- ↓ (d) **Mixed stone**

Complication factors

(1) **Irritation .**

- (a) Inflammation
- ↓ (b) Ulceration
- ↓ (c) Perforation

(2) **Obstruction :**

- (A) Ducts
 - (α) Gall stone colic
 - (b) Obstructive jaundice
- (B) Gall bladder Hydrops
- (C) Liver
 - (α) Enlargement
 - ↓ (b) Failure white bile

(3) **Infection .**

- (A) Ducts suppurative cholangitis
- (B) Gall bladder acute or chronic cholecystitis
- (C) Liver pylephlebitis → portal pyæmia

(4) **Obstruction + Infection :**

- (A) Ducts suppurative cholangitis
- (B) Gall bladder acute or chronic empyema
- (C) Liver portal pyæmia

(5) **Perforation .**

- (A) External fistula
- (B) Peritonitis local or spreading
- (C) Internal fistula

Sequelæ (1) Biliary fistulæ :

- (a) External
 - (α) Spontaneous
 - (β) Surgical
- (b) Internal spontaneous

(2) **Stricture :**

- (a) Gall bladder
 - (α) Hour glass
 - (β) Obliterated
- (b) Ducts due to
 - (α) Impaction
 - (β) Post operative traumatic

- (3) **Peritonitis :** Due to
 - (α) Perforation gall blad
 - (b) Gangrene gall bladder
 - (c) Intestinal obstruction

(4) Intestinal obstruction

- Causes** (a) Impacted gall stone
 (b) Adhesions
- Sites** (1) Lower ileum } stone impaction
 (2) Duodenum }
 (3) Colon } adhesions
- Clinic** *Of stone impaction:*
 (a) Inaugural gall stone dyspepsia
 ↓ (b) Local hypochondritis
 ↓ (c) Repeated intestinal colic
 ↓ (d) Acute intestinal obstruction
- Diag** Acute intestinal obstruction
 In a fat elderly dyspeptic lady
- Treat** Exploration
- (5) **Pancreatitis** Acute or chronic
 (6) **Hepatitis**
 (7) **Carcinoma**

Various conditions of the gall bladder associated with stones

- (A) **Acute cholecystitis**
 (a) Catarrhal cholecystitis
 (b) Hydrops or empyema
 (c) Perforation
 (d) Gangrene
- (B) **Chronic cholecystitis**
 (a) Catarrhal cholecystitis
 (b) Hydrops or empyema
 (c) Fibrosis
 (d) Adhesions
 (e) *Fistulae*
 (f) Carcinoma
- (C) **Latent cholecystitis**
 Cholesterosis of gall bladder
- (D) **Normal gall bladder**

Clinical features

- (1) *Latent syndrome*
 (2) *Digestive syndrome*
Flatulent dyspepsia
 (3) *Local syndrome*
 (A) **Gall stone colic**
 (a) Sudden onset and end
 (b) Repeated colicky pain + vomit + sweat
 (c) Shoulder tip pain
 ↓ (d) Jaundice if stone in the ducts
 (a) Hepatic
 (β) Common

(B) Inflamed gall bladder :

Local pain + tenderness + spasm

(4) Complication syndrome**(A) Acute or chronic cholecystitis****(B) Acute or chronic gall bladder enlargement****(C) Acute or chronic obstructive jaundice****(D) Infective complications****(5) Sequelæ syndrome (See above)****(A) Carcinoma gall bladder****(B) Pancreatitis****Signs (1) Right hypochondritis :**

Pain + tenderness + spasm

(2) Enlarged gall bladder :

With no jaundice

(3) Murphy's sign**(4) Boas's sign****Diagnosis . (A) X-Rays :****(1) Plain X Ray****Positions (a) Antero posterior****(b) Lateral****Shadows Wedding ring**

Cuboidal

Triangular

Multiple

Uniform size

Anterior to vertebral shadows

Outside the kidney area

(2) Barium meal

Persistent duodenal deformity

(3) Cholecystography**Tech Administration of Tetra iodo-phenolphthalein****(a) Oral 4.5 gms****(1) First plate 12 hours after****(2) Second plate 15 hours after****(3) Third plate 18 hours after****(b) Intravenous**

3-4 gms in 50 c.c.s. distilled water

(1) First plate 4 hours after↓ **(2) Second plate 8 hours after**+ **(3) Give fatty meal**↓ **(4) Third plate 11 hours after****Shadows Defective filling**

Poor concentration

Delayed emptying

Distorted gall bladder

. Mottling Negative stone-shadows

(B) Duodenal intubation :

Tech: (a) Introduction of Einhorn upto 28.5"

↓ (b) Instillation of 60 c.c.s. of 25 % mag. sulph

↓ (c) Aspiration of bile.

(α) Excessive mucus

(β) Pus cells

(γ) Cholesterol crystals

(δ) Bacteria

Clinical groups :**(A) Quiescent syndrome . infection absent****(1) No jaundice :**

(a) Gall bladder +

(b) Stone in cystic duct

(2) Jaundice :

(a) Gall bladder —

(b) Stone in hepatic or common ducts

(B) Acute syndrome Infection present

(Same as above)

(1) Stone in gall bladder

(a) No jaundice

(b) Gall bladder . + or —

(2) Stone in cystic duct .

(a) No jaundice

(b) Gall bladder +

(3) Stone in hepatic or common duct :

(a) Jaundice

(b) Gall bladder —

Impaction syndrome :

Site	Colic	Jaundice	Gall bladder	Liver
Gall bladder	—	—	+ or —	—
Cystic duct	+ or —	—	Acute mucocele	—
Hepatic duct	+	+	—	+
Common duct	+	+	—	+

(A) Impaction without infection .**(1) Hartmann's pouch or cystic duct :**

: Acute mucocele of the gall bladder

: (a) Gall bladder + +

(b) Liver —

(c) Jaundice — ,

(2) **Hepatic or common bile duct :**

- (a) Repeated biliary colic
- (b) Gall bladder —
- (c) Liver +
- (d) Jaundice + and fluctuating

(B) *Impaction with infection*(1) **Hartmann's pouch or cystic duct :**

Acute empyema of the gall bladder

- (a) Acute right hypochondritis
- (b) Liver —
- (c) Jaundice —

(2) **Hepatic or common bile duct :**

Suppurative cholangitis (See above)

Charcot's intermittent hepatic fever

- (a) Gall bladder —
- (b) Liver inflammatory enlargement
- (c) Jaundice +
- (d) High intermittent fever

Common sequelæ of stone impaction in common duct

- (1) **Liver inefficiency :** White bile
- (2) **Suppurative cholangitis :** Charcot's fever

Treatment Of gall stones **Operative**

- Ind (a) Failure of medical treatment
- (b) Onset of complications
- (c) Removal as a septic focus typhoid

- Contraind (a) Senility, debility, obesity
- (b) Cardio vascular or renal disease
- (c) Pregnancy

Time to operate

- (a) Interval time
- (b) After pre operative preparation
- (c) Acute urgent complication
 - (a) Infection
 - (β) Progressive obstruction

Choice of operation

- (1) *General condition of patient :*
 - (a) Good radical measures
 - (b) Bad temporary measures (palliative)
- (2) *Jaundice*
 - (A) Operate immediately if
 - (a) Jaundice immediate after colic
 - (b) Persistent jaundice with intense pain
 - (c) Jaundice with wasting

- (B) **Temporise if :**
 (a) Mild jaundice
 + (b) Recurrent attacks of :
 Biliary colic + jaundice

(3) *Position of the stone :*

(A) **Impaction + infection :**

- (a) Cholecystostomy
 or (b) Choledochostomy
 + (c) Morison pouch drain

(B) **Impaction without infection :**

- (a) Stone in gall bladder or cystic duct only :
 (a) If no jaundice
 Cholecystectomy
 (β) If jaundice
 Cholecystostomy
 (b) Stones in gall bladder + common duct :
 (a) Removal of the gall bladder stone
 + (β) Removal of common duct stone
 + (γ) Cholecystostomy
 + (δ) Choledochostomy
 (c) Stone in common duct only :
 (a) Removal of the stone
 + (β) Choledochostomy

(4) *Pathology found at the operation*

(A) **Numerous adhesions :**

- (a) Removal of stones
 + (b) Cholecystostomy

(B) **White bile :**

- Two stage operation
 (a) Cholecystostomy or choledochostomy
 ↓ (b) Removal of stones

(C) **Only gall bladder affected :**

Cholecystectomy

(D) **Bile duct pathology :**

- (a) Remove the stone
 + (b) Drain via (α) Gall bladder
 (β) Bile duct
 (c) *Never do cholecystectomy*

(E) **Presence of jaundice :**

- (a) Always explore the ducts
 (b) Remove the stones
 (c) Drain
 (d) *Never do cholecystectomy*

(F) **Presence of sepsis :**

- Drainage only
 (a) Bile stained discharge :
 : Simple drainage

- (b) Bile less discharge
 (α) Removal of stone
 + (β) Drainage

Technique of operation (See under operations)

Post operative treatment and complications (See under operations)

(VI) NEW GROWTHS OF BILIARY APPARATUS

(1) CARCINOMA GALL BLADDER

Etiology Women above 50

- Causes (a) Gall stones in more than 90% cases
 (b) Chronic cholecystitis

- Sites (1) Fundus
 (2) Body
 (3) Neck

- Macroscopy (a) Local irregular tumour } Infiltrating
 (b) Diffuse thickening }
 (c) Fungating villous
 (d) Fibrotic

- Microscope (1) Columnar
 (2) Squamous irritative metaplasia

- Clinic (1) History of chronic cholecystitis or gall stones
 (2) Hard nodular tumour
 (a) Clinical finding
 (b) Operative finding

- Diff diag (a) Chronic cholecystitis
 (b) Cholelithiasis
 (c) Carcinoma stomach
 (d) Carcinoma colon

- Compl (1) Fistulæ
 (2) Adhesions
 (3) Infiltration into surrounding viscera
 (4) Obstructions (a) Biliary
 (b) Pyloric
 (c) Colon
 (5) Malignant peritonitis

- Treat (A) Exploratory laparotomy
 ↓ (B) Treatment of the focus
 (a) Intra-cholecystic carcinoma
 Cholecystectomy
 (b) Local involvement of liver
 (α) Cholecystectomy
 + (β) Wedge resection of liver
 (c) Extensive involvement
 Leave alone

(2) CARCINOMA BILE DUCTS

Etiology Bile stone

Path: Low malignancy
 : Small size
 : Slow growth
 : No metastases

Clinic: (1) **Insidious, progressive, persistent, painless jaundice:** Yellow → olive green → grey

(2) **Gall bladder: Distended**

(a) Hepatic duct gall bladder —

(b) Duct confluence.

. Mucocele of the gall bladder

(c) Common duct

. Cholocele of the gall bladder

(3) **Liver: Enlarged**

Diff. diag. (1) Stones in the duct

(2) Duct stenosis

(3) Pressure obstruction:

(a) Chronic pancreatitis

(b) Carcinoma pancreas

(c) Carcinoma stomach

(d) Sub hepatic abscess

(4) Kinking of the duct

Mobile kidney

Compl: (a) **Cholæmia** with hepatic failure

(b) **Biliary infection**

(c) Hæmorrhage

Treat (1) **Excision:** Where possible

↓ (2) **Short circuit:** Cholecyst enterostomy

(A) Carcinoma ampulla of Vater

(a) *Operable*. Excision

(b) *Inoperable* Cholecyst jejunostomy

(B) Carcinoma common bile duct.

(a) *Operable*

(α) Excision

↓ (β) Ligature both ends

↓ (γ) Cholecyst gastro or duodenostomy

or (γ) Choledochoduodenostomy

(b) *Inoperable*

(α) Cholecyst-gastrostomy

(β) Hepaticostomy

(C) Junctional carcinoma.

(a) *Operable*

(α) Excision + cholecystectomy

(β) Ligature of distal end

(γ) Hepatico-duodenostomy

(b) *Inoperable:*

; Cholecyst-gastrostomy

(D) Carcinoma common hepatic duct:

: Hepaticostomy

(VII) BILIARY FISTULAE

- Varieties**
- (1) **External**
 - (2) **Internal**
 - (A) **Pathological** or spontaneous
 - (a) **External** at the umbilicus
 - (b) **Internal**
 - (α) Stomach
 - (β) Duodenum
 - (γ) Colon
 - (B) **Traumatic** or **post operative**
 - (a) **Post cholecystostomy**
 - (α) Mucoid cystic duct obstruction
 - (β) Biliary common duct obstruction
 - (b) **Post cholecystectomy**
 - Injury to common duct
- Causes**
- (1) **Pathological**
 - (A) Gall stones
 - (B) Carcinoma
 - (a) Gall bladder
 - (b) Stomach
 - (c) Colon
 - (C) Duodenal ulcer
 - (2) **Post operative**
 - (A) Trauma to biliary ducts
 - (B) Drainage in **non removed obstruction**
 - (a) Calculus
 - (b) Stricture
 - (c) Pancreatitis
 - (d) Carcinoma
- Clinic**
- (1) History of biliary trouble or operation
 - (2) Fistula right upper abdomen
 - (3) Discharge
 - (a) Mucoid
 - (α) Mucocoele of the gall bladder
 - (β) White bile hepatic failure
 - (b) Bile obstruction to biliary ducts
 - (c) Biliary pus suppurative cholangitis
 - (d) Pus empyema of the gall bladder
 - (4) Skin irritation or digestion
- Diag**
- (A) Examination of the fistula
 - (a) Site
 - (b) Skin irritation
 - (B) Examination of the discharge
 - (a) Physical
 - (α) Yellow colour
 - (β) More flow after
 - (1) Cholagogues
 - (2) Fatty meals
 - (b) Chemical
 - (α) Alkaline reaction
 - (β) Chemical composition

Diff. diag :

- (1) Gastric fistula : acid reaction
- (2) Duodenal fistula . bile + food
- (3) Jejunal fistula : bile + food
- (4) Enteric fistula * intestinal contents
- (5) Colic fistula . faeces
- (6) Umbilical sinus : pus
- (7) Pleural or peritoneal sinus * pus
- (8) Bone or cartilage sinus . pus

Compl : (1) Bile starvation
(2) Skin irritation → digestion

Treatment: External post operative fistula:

(1) **Conservative:** For 8 to 12 weeks

(a) Protective dressings:

(a) Emollients vaseline

(3) Acid : dilute citric acid

(b) Suction drainage

(c) Biliary antiseptics : Hexamine
: Felamine
: Cylotropin

(d) Intestinal drainage: Purges

(e) Bile supply

: Introduction of bile per rectum

↓ (2) **Pre-operative cholangiography**

↓ (3) **Operative:**

Ind: (a) Persistence for 3 months

(b) Absence of bile in faeces

(c) Jaundice on temporary closure

Tech : (1) Removal of the cause of obstruction

+ (2) Repair of the ducts

or (3) Short circuit

or (4) Transplantation of fistula into duodenum

(VIII) OBSTRUCTION OF COMMON BILE DUCT:

Causes : (A) Lumen :

(a) Gall stones or biliary mud

(b) *Ascaris lumbricoides*

(B) Wall:

(a) Cholangitis

(b) Operative trauma

(c) **Stricture**

(d) New growth

(C) Outside pressure :

(a) **Chronic pancreatitis**

(b) **Carcinoma: Stomach**

: **Pancreas**

: Gall bladder

: Colon

- (2) Electro coagulation of posterior adherent wall
- (3) Approximation of the edges of left out posterior wall
- (4) Free omental or round lig graft
- (D) *Partial cholecystectomy with drain*
Ind Adhesions
- (E) *Removal or cauterisation of mucous membrane only*
Ind Adhesions

(3) CHOLELITHOTOMY

- Steps (1) **Exposure** of the whole biliary area
 ↓ (2) **Isolation** of the field
 ↓ (3) **Thorough exploration**
 By (α) Visual
 (β) Tactile
 (γ) Instrumental
 Of (a) Gall bladder
 (b) Biliary ducts
 (α) Right and left hepatic
 (β) Common hepatic
 (γ) Cystic
 (δ) Common bile
 (c) Pancreatic head
 ↓ (4) **Cholecystectomy**
 If stones are limited to gall bladder
 No pathology of biliary ducts
 or (4) **Cholecystotomy**
 ↓ (5) **Removal of the stones .**
 Till bile flows freely
 ↓ (6) **Cholecystostomy**
 + (7) **Treatment of other foci ducts**

(4) CHOLECYSTENTEROSTOMY

- Varieties (1) Cholecyst gastrostomy
 Ind Pyloric ulcer
 (2) Cholecyst duodenostomy
 Ind Most natural
 (3) Cholecyst jejunostomy
 Ind (a) Carcinoma pylorus
 (b) Carcinoma Vater
 (c) Carcinoma pancreas advanced

- Indication **Irremovable or impermeable common duct obstruct**
 (A) **Diseases of pancreas**
 (a) Chronic pancreatitis
 (b) Carcinoma pancreas

- (B) Diseases of the biliary ducts
 - (a) Traumatic stricture
 - (b) Post impaction stricture
 - (c) Carcinoma common duct
- (C) Diseases of stomach and duodenum
 - (a) Posterior adherent ulcers
 - (b) Carcinoma
- Steps (1) Exposure and isolation of biliary area
- (2) Aspiration of the gall bladder
 - (a) Thick black bile good
 - (b) White bile
 - (α) Hepatic failure
 - (β) *Obstruction to cystic or hepatic duct*
- (3) Examination of the biliary ducts
- (4) (A) Cholecyst gastrostomy
 - (a) Clamping 2" of
 - (α) Fundus gall bladder
 - (β) Ant. pyloric wall
 - (b) Anastomosis
 - (α) Posterior seromuscular
 - ↓ (β) Incisions 1"
 - ↓ (γ) Posterior through and through
 - 0 or 00 chromic
 - ↓ (δ) Anterior through and through
 - ↓ (Δ) Anterior seromuscular
 - (c) Omental graft
- (B) Cholecyst duodenostomy
 - As above but no clamps
- (C) Cholecyst-jejunostomy
 - Site 18" from flexure
- Tech (a) Posterior
 - (α) Through mesocolon
 - (β) Through gastroduodenal omentum
- (b) Anterior
 - (α) Anterior to transverse colon
 - + (β) Entero anasto between loops

(B) BILE DUCTS

(1) CHOLDOCHOTOMY AND STOMY.

- Ind (a) Biliary stones
- (b) Trauma to ducts
- (c) Stricture of the ducts
- Tech (A) Moynihan's rotation technique :

- Ind Impacted calculus with
 - (a) Bad general condition
 - (b) Extensive adhesions

- Steps. (1) Isolation of the biliary field :
 - . Gauze in the foramen of Winslow

- (2) Manual torsion of the duct
- (3) Bilateral stay sutures :
: In the duct wall
- (4) Incision of the duct wall
- (5) Extraction of the stone
- (6) Probe exploration of lumen :
: Up and down
- (7) Drainage of the duct

(B) Supraduodenal choledochotomy :

- (1) Exposure of whole biliary area
- (2) Thorough examination :
By (a) Inspection
(b) Palpation
(c) Incision
Of (a) Gall bladder
(b) All ducts
(c) Head of the pancreas
- (3) Exposure of the common duct
- (4) Palpation and milking of stone
- (5) Fixation of the duct :
(a) Manual
(b) Stay sutures
- (6) Isolation of the duct : by packs
- (7) Incision of the duct
- (8) Extraction of all calculi
- (9) Explore by sound or probe :
Up and down
- (10) Dilatation by bougies
- (11) Treatment of gall bladder :
Cholecystostomy if :
• (a) Jaundice
(b) Biliary detritus
(c) Biliary sepsis
(d) Unremoved stone
- (12) Drainage
(a) Ductal
Ind. (1) Jaundice
(2) Detritus
(3) Unremoved stone
(4) Biliary sepsis
Tech. (1) Small rubber tube :
• passed upwards
: Secured to :
(a) Duct wall
(b) Skin
(2) T tube for weeks :
: In severe sepsis

- (3) Arrange the omentum about the tube
- (4) Straight course of the tube

(b) Morison pouch always

(C) Retro-duodenal choledochotomy

Ind Impacted stone in 2nd part
With inability to milk it up

- Tech (1) Mobilisation of the duodenum
- (a) Incision
 - Kocher's para-duodenal
 - (b) Stripping up of the duodenum
- (2) Identification and isolation of the duct
- (3) Incision → extraction → exploration
For stones
- (4) Drainage
- (a) Morison
 - (b) Down to site of ductal incision

(D) Trans duodenal choledochotomy

- (1) McBurney's ampullary choledochotomy

Ind Impaction in ampulla of Vater

- Steps (1) Mobilisation of duodenum
- (2) Isolation of duodenum
 - (3) Incision of duodenum
 - (a) In the long axis
 - (b) Opposite the ampulla
 - (4) Incision of ampulla
 - (5) Extraction of stone
 - (6) Internal probe exploration of duct
 - (7) Transverse closure of duodenum
 - (8) Omental graft

- (2) Kocher's transduodenal choledochoduodenostomy

Ind Impacted stone in 2nd or 3rd part

- Tech (1) Mobilisation of duodenum
- (2) Isolation of duodenum
 - (3) *Incision of duodenum*
 - (a) In the long axis
 - (b) Opposite the ampulla
 - (4) Inspect & palpate for stone
 - (5) Incise
 - (a) The post-duodenal wall
 - (b) Over the impacted stone
 - (6) Stay sutures
 - (a) Lateral
 - (b) Upper and lower angles
 - (7) Extraction of the stone

- (8) Exploration of the duct
- (9) Tie and cut short the stay sutures
- (10) Transverse closure of anterior duodenal wall

Pribram's method for stone impacted in retro duodenal common duct

- Tech**
- (1) **Rubber drainage tube:**
 - (a) Without lateral hole
 - (b) Smaller than duct lumen
Allowing bile to pass along
 - (c) Down to the calculus
 - (d) No kink
 - (e) Water tight junction
 - ↓ (2) **Lipoidol radiography:**
(Cholangiography)
6 days after
 - ↓ (3) **Ether injections:**
 - (a) Few drops to 5 c c
 - (b) Several times a day
 - ↓ (4) **Liquid paraffin injections:** 1 c c
 - ↓ (5) Repeat (3) and (4)

Result Stone dissolved

(2) CHOLEDOCHO CHOLEDOCHOSTOMY

Syn End to end anastomosis

- Ind**
- (1) Immediately after division in cholecystectomy
 - (2) Immediately after resection
 - (a) New growths
 - (b) Stricture

Steps (a) **Temporary tube method**

- (1) Mobilisation of the duct ends
- (2) Exploration of ducts
- (3) Interrupted sutures chromic 000 or 000 000
Over a rubber tube withdrawn just before the final suture
- (4) Drainage upto anastomosis for 5 days

(b) **T tube method**

- (1) Mobilisation of duodenum
- (2) Anastomosis over a T tube
Tube taken out after 3 weeks

(c) **Two tubes method**

- (1) Hepatic tube for drainage
- (2) Duodenal tube for feeding
- (3) Glass connection between (1) and (2)
For three weeks

(3) CHOLEDOCHO-DUODENOSTOMY

(A) **Lateral choledocho-duodenostomy**

- Ind**
- (a) Obstruction in low retroduodenal part
 - + (b) Great proximal dilatation of the duct

- Tech** (a) Mobilisation of the duodenum
(b) Anastomosis of (α) Duct
Transverse incision
(β) Duodenum
Vertical incision
(c) Omental graft
(B) Colley's end to-side choledcho-duodenostomy
(C) Mayo's hepatico-duodenostomy
Tech (1) Curved flap incision in duodenum
(2) Suture of the duodenal opening to
(a) Hepatic duct
or (b) Liver capsule
(3) Approximation of duodenum to liver
(4) Omental graft
(D) Hepatico jejunostomy
Ind Duodenum unavailable
Site 14" from the flexure
DUCT RECONSTRUCTION OPERATIONS
(A) Sullivan's gap anastomosis Over a rubber tube
(B) Walton's anterior duodenal flap Over a rubber tube
(C) Moynihan's post duodenal flap Over a rubber tube
CHOLEDOCHECTOMY
Ind (a) Primary carcinoma
(b) Carcinomatous infiltration
(c) Stricture
Tech (A) First stage Biliary drainage
(a) Choledochostomy
or (b) Cholecystostomy
or (c) Cholecyst-enterostomy
(B) Second stage Excision + ligature both ends
With (a) Cholecyst enterostomy
or (b) Hepatico-duodenostomy
or (c) Reconstruction operations

(III) POST-OPERATIVE TREATMENT

- (1) **Hepatic.**
 (a) Fluids or saline
 (b) Glucose + (insulin)
 (c) Soda bi carb } by { (a) Mouth
 (b) Rectum
 (c) Veins
- N B No intravenous saline in jaundice
- (2) **Biliary antisepsis and drainage:**
 (a) Epsom salts with calomel
 (b) Belladonna
 (c) Cholagogues and antiseptics
 (See pre operative treatment)
- (3) **Dressings.**
 (a) Skin protection emollients with citric acid
 (b) Suction drain

(c) Morison tube out 4th day

(d) Gall bladder and bile duct tubes 10th day

(4) Care of the stomach

Ind (a) Distension

(b) Vomiting

Treat (1) Gastric lavage

(2) Ryle's tube drain

(5) Care of the chest

(a) Co or ben/oin inhalations

(b) Turpentine or lint camphor to the chest

(c) Inj camphor in oil

(6) Care of the intestines

(a) Antiseptics bismuth, carbon

(b) Laxatives calomel, salines

(c) Bile per rectum

(7) Bile salts + pancreatic extract + enzymes

(IV) POST-OPERATIVE COMPLICATIONS

(A) Immediate

(1) Shock

(2) Haemorrhage

(3) Acute gastric dilatation

(4) Paralytic ileus

(5) Acute pulmonary complications

(6) Cardio vascular failure

(7) Hiccough

(B) Intermediate

(7) Peritonitis

(8) Liver death

(A) Hepatic

(B) Renal

(a) Hyperpyrexia

(b) Uræmia

(9) Burst abdomen

(10) Cholæmia

(11) Cholangitis

(12) Sub acute pancreatitis

(13) Local abscesses

(C) Late

(14) Chronic pancreatitis

(15) Overlooked or recurrent gall stones

(16) Biliary fistula

(17) Recurrence of symptoms

(a) Post cholecystectomy syndrome

Cause Sphincter spasm

Treat (1) Amyl nitrite inhalations

(2) Glyceryl trinitrate 1/100 gr oral

(b) Adhesions

- (c) Stones
- (d) Hepatitis
- (e) Pancreatitis
- (18) *Ventral hernia*
 - (1) Pulmonary
 - (a) Pneumonia
 - (b) Bronchitis
 - (c) Pleurisy
 - (d) Embolism
 - (e) Oedema of the lungs
 - (f) Collapse of the lungs
 - (2) Cardiac
 - (1) Fibrillations
 - (2) Tachy or brady cardia
 - (3) Failure
 - (3) Circulation
 - (a) Shock
 - (b) Hæmorrhage
 - (4) Hepatic
 - (1) Failure
 - (2) Cholemia
 - (5) Biliary
 - (a) Sepsis cholangitis
 - (b) Unrelieved jaundice
 - (6) Alimentary
 - (1) Acute gastric dilatation
 - (2) Paralytic ileus
 - (7) Renal uræmia
 - (8) Pancreatic
 - (a) Chronic pancreatitis
 - (b) Asthenia
 - (c) Diabetes
 - (9) Local
 - (a) Biliary fistula
 - (b) Sepsis
 - (a) Superficial abdominal wall
 - (b) Regional subphrenic abscess
 - (c) Neighbouring pleurisy
 - (d) Abdominal peritonitis
 - (c) Turst abdomen
 - (d) Ventral hernia

(XI) IMPORTANT POINTS

- (1) *Temporary control of cystic artery hæmorrhage*
Compression of the lesser omental border between finger in foramen of Winslow and the other finger the front (Heparth Principle)
- (2) *The first essential step in cholecystectomy is the demonstration of the function of cystic duct het ill*

(c) Morison tube out - 4th day

(d) Gall bladder and bile duct tubes - 10th day

(4) Care of the stomach :

Ind (a) Distension

(b) Vomiting

Treat (1) Gastric lavage

(2) Ryle's tube drain

(5) Care of the chest :

(a) Co. or benzoin inhalations

(b) Turpentine or lint camphor to the chest

(c) Inj camphor in oil

(6) Care of the intestines :

(a) Antiseptics bismuth, carbon

(b) Laxatives calomel, salines

(c) Bile per rectum

(7) Bile salts + pancreatic extract + enzymes

(IV) POST-OPERATIVE COMPLICATIONS

(A) Immediate

(1) Shock

(2) Hæmorrhage

(3) Acute gastric dilatation

(4) Paralytic ileus

(5) Acute pulmonary complications

(6) Cardio vascular failure

(7) Hiccough

(B) Intermediate

(7) Peritonitis

(8) Liver death.

(A) Hepatic

(B) Renal

(a) Hyperpyrexia

(b) Uræmia

(9) Burst abdomen

(10) Cholæmia

(11) Cholangitis

(12) Sub acute pancreatitis

(13) Local abscesses

(C) Late -

(14) Chronic pancreatitis

(15) Overlooked or recurrent gall stones

(16) Biliary fistula

(17) Recurrence of symptoms :

(a) Post cholecystectomy syndrome :

Cause Sphincter spasm

Treat (1) Amyl nitrite inhalations

(2) Glyceryl trinitrate 1/100 gr oral

(b) Adhesions

- (c) Stones
- (d) Hepatitis
- (e) Pancreatitis
- (18) *Ventral hernia*
 - (1) Pulmonary
 - (a) Pneumonia
 - (b) Bronchitis
 - (c) Pleurisy
 - (d) Embolism
 - (e) Œdema of the lungs
 - (f) Collapse of the lungs
 - (2) Cardiac
 - (1) Fibrillations
 - (2) Tachy or brady cardia
 - (3) Failure
 - (3) Circulation
 - (a) Shock
 - (b) Hæmorrhage
 - (4) Hepatic
 - (1) Failure
 - (2) Cholæmia
 - (5) Biliary
 - (a) Sepsis cholangitis
 - (b) Unrelieved jaundice
 - (6) Alimentary
 - (1) Acute gastric dilatation
 - (2) Paralytic ileus
 - (7) Renal uræmia
 - (8) Pancreatic
 - (a) Chronic pancreatitis
 - (b) Asthenia
 - (c) Diabetes
 - (9) Local
 - (a) Biliary fistula
 - (b) Sepsis
 - (a) Superficial abdominal wall
 - (b) Regional subphrenic abscess
 - (c) Neighbouring pleurisy
 - (d) Abdominal peritonitis
 - (c) Burst abdomen
 - (d) Ventral hernia

(XI) IMPORTANT POINTS

- (1) *Temporary control of cystic artery hæmorrhage*
Compression of the lesser omental border between one finger in foramen of Winslow and the other finger from the front (Hogarth Pringle)
- (2) *The first essential step in cholecystectomy is the clear demonstration of the junction of cystic duct, hepatic duct and the common duct*
- (3) *Congenital variations in the biliary apparatus and its vascular supply are extremely common and so nothing should be divided which has not been first clearly identified and demonstrated to an assistant*

- (c) Incis on
- ↓ (d) Probing
- (20) Ducts should be probed even on suspicion even when no calculi can be palpated in cases where jaundice is present.
- (21) Cholecystitis with or without gall stones is by no means to be ruled out as impossible in children under 15, especially in whom previous appendicectomy has been ineffective.
- (22) *Cholecystectomy should never be performed unless it is certain that the common bile duct is patent*
- (23) Infection of the gall bladder
 - (a) Intra mural haematogenous
 - (b) Mucous membrane biliary
- (24) Cholecystitis and cholelithiasis lead to each other
- (25) *Important factors in cholelithiasis*
 - (a) Infection
 - (b) Biliary stasis
 - (c) Cholesterolæmia
- (26) In gall stones
 - (a) Jaundice without gall bladder
Stone in hepatic or common duct
 - (b) Gall bladder without jaundice
Stone in Hartmann or cystic duct
 - (c) No gall bladder with no jaundice
Stones in the gall bladder
- (27) *If carcinoma of common duct or pancreas*
 - (a) Gall bladder —
 - (b) Liver —
 - (c) Jaundice —
- (28) *If gall stones jaundice is intermittent or fluctuating, in carcinoma, jaundice is permanent and progressive*
- (29) Post-operative non healing biliary fistula
 - (a) Missed stone in common duct
 - (b) Injury to the ducts.
- (30) *Obstructive jaundice persisting for over 4 weeks in patients who are at or past middle age is due to carcinoma*
 - (a) Carcinoma biliary duct
 - (b) Carcinoma head of the pancreas
 - (c) Carcinoma ampullary duodenum.
- (31) Short circuit is best in stricture of the ducts.
- (32) *In all cases of jaundice, pre-operative treatment must consist of*
 - (a) Blood coagulants
 - (b) Hepatic support
 - (c) Biliary antiseptics

- (33) Cholecystectomy is necessary even when there are no symptoms, in following circumstances
- (a) Typhoid carrier
 - (b) Gall bladder as a septic focus.
- (34) Most common post operative complications in biliary operations
- (a) Acute gastric dilatation
 - (c) Paralytic ileus
 - (b) Hepatic inefficiency
 - (d) Cholæmia
 - (e) Pulmonary catarrh
- (35) Late sequelæ of gall stones
- (a) Hepatitis
 - (b) Chronic pancreatitis
 - (c) Biliary sepsis cholangitis
 - (d) Carcinoma.
- (36) *In every biliary case*
- (a) *See the association between*
 - (a) Gall bladder
 - (β) Jaundice
 - (b) *See whether the jaundice is*
 - (a) Intermittent or fluctuating
 - (β) Permanent and progressive
 - (1) Intermittent jaundice + non palpable gall bladder
 - Stone in (a) Hepatic duct
 - (b) Common duct
 - (2) Intermittent jaundice + palpable gall bladder
 - Stone at three duct junction
 - (3) Persistent jaundice + palpable gall bladder
 - (a) Carcinoma common duct
 - (b) Carcinoma pancreas
 - (c) Chronic pancreatitis
 - (4) No jaundice + palpable gall bladder
 - Stone in (a) Hartmann pouch
 - (b) Cystic duct.
- (37) If perforated duodenal ulcer or high retrocæcal appendicitis cannot be excluded from acute cholecystitis, it is essential to explore immediately
- (38) *Uncertainty of diagnosis and not the fear of perforation, which is rare, remains the chief indication for acute gall bladder surgery*
- (39) Main indications for operation in gall bladder disease
- (1) Obstruction to biliary duct jaundice
 - (2) Biliary sepsis
 - (3) Recurrent biliary colic
 - (4) Enlarged gall bladder
 - (a) Hydrops
 - (b) Empyema.

- (62) Choice of operation in duct trauma
 (a) If immediate
 End to end suture
 (b) If late
 (1) Gall bladder present
 (a) Ligature of ends
 ↓ (b) Cholecyst entero or gastrostomy
 (2) Gall bladder absent
 (a) Hepatico duodenostomy
 or (b) Reconstruction operation
- (63) *Intravenous saline should never be given in cases of unre-
 lieved obstructive jaundice* as it leads to interference with
 kidney functions
- (64) A strip of gauze in foramen of Winslow helps to display the
 common duct and absorb any infected bile
- (65) Always leave a strip of rubber dam down to the region of
 foramen of Winslow in every case of cholecystectomy, it
 should be brought out through a separate stab wound
- (66) Jaundice
 (A) Obstructive
 (a) Stone in common duct
 (b) Carcinoma pancreas
 (c) Chronic pancreatitis
 (d) Carcinoma common duct
 (e) Duct injuries
 (B) Hæmatogenous
 (a) Pernicious anæmia
 (b) Acholuric jaundice
 (C) Hepatic
 (a) Cirrhosis liver
 (b) Syphilis
- (67) Cholecystitis in man is due to
 (a) Bacterial infection
 (α) Mural
 (β) Biliary
 (b) Disturbed cholesterol metabolism
- (68) Cholesterosis of the gall bladder
 (a) Strawberry gall bladder
 ↓ (b) Polypoid gall bladder
 ↓ (c) Cholesterol stone
- (69) Γῤῥ, fertile female of forty
 (a) Gall stones
 (b) Πῤῥ umbilical hernia.
- (70) In a case of suspected gall stones, find out the state of
 jaundice

- (a) No jaundice
- (b) Intermittent or fluctuating jaundice
- (c) Permanent progressive jaundice
- (71) Gall bladder operations
 - (1) Incisions of choice
 - (a) Midline or *right para median*
 - (b) Right transrectus vertical
 - (c) *Kocher*
 - (2) Important steps
 - (a) Careful examination of the whole biliary apparatus
 - (b) *Demonstration of three-duct junction*
 - (c) Careful ligature of cystic artery
 - (d) Drainage
 - (1) Morrison always
Upto the duct incisions or duct stump
Keep for 4 days
 - (2) Duct lumen when jaundice or sepsis
T tube or tube directed proximally
Keep for 10 days
- (72) Recurrence of symptoms after gall bladder operations
 - (1) Adhesions
 - (2) Missed or recurrent gall stones
 - (3) Hepatitis degenerated liver
 - (4) Pancreatitis
 - (5) Spasm of Oddi
 - (6) Another abdominal overlooked focus
 - (a) Peptic ulcer
 - (b) Appendicitis
- (73) *Most common causes of death after biliary operations*
 - (a) Shock
 - (b) *Hæmorrhage*
 - (c) *Acute gastric dilatation or paralytic ileus*
 - (d) *Hepatic inefficiency*
 - (e) *Cholæmia*
 - (f) *Cholangitis*
 - (g) *Renal failure*
 - (h) *Pancreatic asthenia*
 - (i) *Chest complications*
- (74) *Physiology of gall bladder*
 - (a) *Secretion of bile per day* 800-1400 c cs
 - (b) *Capacity of gall bladder* 30-50 c cs
 - (c) *Concentration power of gall bladder* 6-10 times
 - (d) *Referred pain in gall stones* Scapular region
6-7 Dorsal
- (75) In over 60% of patients it is anatomically possible for pancreatic juice to regurgitate into gall bladder. The presence of pancreatic juice in the gall bladder seems to cause precipitation of cholesterol with formation of pure cholesterol stone. (Med. Ann 1940)

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- (75) In over 60% of patients it is anatomically possible for pancreatic juice to regurgitate into gall bladder. The presence of pancreatic juice in the gall bladder seems to cause precipitation of cholesterol with formation of pure cholesterol stone. (Med. Ann 1940)

- (76) Haemorrhagic tendency in obstructive jaundice is due to prothrombin deficiency, which is the result of failure of absorption of vitamin K, which requires bile for its absorption (Med Ann 1940)
 - (77) *Without bile salts, vitamin K is useless*
 - (78) Administration of vitamin K with bile salts is better than blood transfusion in obstructive jaundice.
 - (79) As a rule acute cholecystitis will settle down with expectant treatment and unless seen within first 48 hours or unless there is evidence of suppuration or gangrene, it is better to wait for a quiet interval before operating. For chronic cholecystitis, cholecystectomy is better. For empyema of the gall bladder, cholecystostomy is safer.
 - (80) Cholangitis due to impacted gall stone
 - (a) Kehr's external drainage
 - (b) Czerny's dilatation of Oddi
 - (c) Jurasz choledochoduodenostomy
 - (81) *Never be in a hurry to operate upon a patient who has had a recent attack of gall stone colic unless cholangitis is present*
 - (82) Jaundice means depressed liver function and operation during the condition leads to unexpected death hence *no operation should be undertaken on a jaundiced patient, unless for the relief of the jaundice and then too, minimum possible interference required for the relief of the condition should only be done, leaving more radical procedures to the next stage.*
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CHAPTER XI

THE PANCREAS

(I) CONGENITAL ABNORMALITIES:

(A) ACCESSORY PANCREATIC TISSUE

- Sites (a) Duodenal wall
 (b) Lesser omentum
 (c) Meckel's diverticulum

(B) ACCESSORY DUCTS

(C) MULTICYSTIC DISEASE

Associated with similar affection of the kidneys and liver

(II) TRAUMA:

Etiol (a) Hits over the epigastrium

(b) Penetrating wounds

(c) Operative trauma

Inclusion of tail in splenectomy ligature

(A) SERIOUS

Clinic Acute traumatic abdomen with

(a) Fat necrosis

(b) Hæmorrhagic peritoneal fluid

(B) SUBACUTE

Clinic (a) History of trauma

(b) Period of interval

(c) Cystic epigastric swelling

Pancreatic pseudocyst

Compl of *pancreatic trauma*

(1) Pancreatitis

(2) Hæmorrhage

(3) Fat necrosis

(4) Pseudocyst

(5) Peritonitis

(6) Retroperitonitis

Treat of *pancreatic trauma*

(A) Conservative

(B) Operative

Ind (a) Acute peritonitis

(b) Local peritonitis

(c) Pseudocyst

Tech (1) Exploratory laparotomy

(2) Opening into lesser sac

(3) Treatment of pancreatic focus

(4) Lesser sac toilet

(5) Lesser sac drainage

Post-compl Burst abdomen

(III) INFLAMMATIONS OF THE PANCREAS:

Routes. (1) Biliary route :

Path. (a) Common opening for (1) Bile duct
(2) Pancreatic duct
+ (b) Spasm of sphincter of Oddi
+ (c) Infected bile

Clinic Acute and subacute pancreatitis

(2) **Lymphatic route :**

Path Ascending infection from

(a) Pyloric glands

(b) Superior mesent glands

(c) Biliary glands

Clinic Chronic pancreatitis

(3) **Hæmatogenous route.**

Etiology Mumps

Path	Catarrhal parenchymatous
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(4) **Contiguity :**

Etiology (a) Pyloric ulcer

(b) Duodenal ulcer

(1) ACUTE PANCREATITIS

Def. Auto digestion of pancreatic and peri pancreatic tissues due to liberation of pancreatic enzymes

Etiology (1) Traumatic (a) Penetrating wounds
(b) Contusions

(2) **Biliary infection:** Suppurative cholangitis

(3) **Lithiasis:** (a) Biliary calculi
(b) Pancreatic calculi

(4) Post operative (a) Gastric operations
(b) Splenectomy
(c) Nephrectomy

(5) Mumps

Path (a) Cholecystitis, cholangitis, bile stones

↓ (b) Spasm of sphincter of Oddi

↓ (c) Acute retrojection of infected bile

↓ (d) Activation of trypsinogen

↓ (e) Auto digestion of pancreatic tissue

↓ (f) Pancreatic enzymes set free

↓ (g) Peripneumonitis

+ Haemorrhagic effusion

- + Fat necrosis

↓ (f) Infection

Special changes. (1) **Acute glossy œdema**

(2) **Fat necrosis :**

(a) Liberated pancreatic enzymes

↓ (b) Saponification of neutral fat

↓ (c) Fatty acids + calcium

↓ (d) Soap

(3) **Blood-stained peritoneal exudate :**
With pancreatic ferments

Path stages (A) **Œdema pancreas**
(B) **Hæmorrhage** } of pancreas
Infarction }
Necrosis }

(C) **Peritonitis** or abscess

Path types (1) **Hæmorrhagic**
(2) **Gangrenous**
(3) **Purulent**
(a) **Catarrhal**
(b) **Parenchymatous**

Clinic (A) **Gall stone diathesis**
(B) **Acute abdomen :**
(a) **Intense epigastric pain**
(b) **Retching**
(c) **Tenderness**
(d) **Absence of rigidity**
(e) **Free fluid in peritoneum**
(C) **General signs :**
(a) **Collapse +**
(b) **Dusky cyanosis :** Of face and neck
(c) **Slight jaundice**
(D) **Special signs :**
(a) **Loewi's mydriatic test**
(b) **Cullen**
Yellowish discoloration of umbilicus
(c) **Grey Turner**
Yellowish discoloration in loin
(E) **Laboratory tests :**
(a) **Blood** (a) **Sugar**
(β) **Diastase**
(b) **Urine** (a) **Sugar**
(β) **Diastase**

Stages (A) **First stage :**

Path **Œdema pancreas**

Clinic. **Violent pain :** Radiating to left shoulder

(B) **Second stage .**

Path (a) **Hæmorrhage** } of pancreas
(b) **Infarction** }
(c) **Necrosis** }

Clinic **Acute intestinal obstruction syndrome :**
Without arrest of flatus and feces

(C) **Third stage :**

Path **Peritonitis** or abscess

Clinic. (a) **Peritonitis syndrome**
or (b) **Epigastric tumour**

Diff. diag	Any other cause of :	(1) Profound shock (2) Acute abdomen (3) Acute toxæmia
	(1)	Gall bladder colic
	(2)	Renal colic
	(3)	Heart colic angina pectoris
	(4)	Perforated peptic ulcer
	(5)	Acute appendicitis
	(6)	Acute intestinal obstruction
	(7)	Acute hæmo peritoneum
	(8)	Acute pulmonary crisis
Compl	(1)	Acute epigastritis
	(2)	Acute general peritonitis
	(3)	Acute retro peritoneal cellulitis
	(4)	Sub acute pancreatitis → omental bursitis
	(5)	Localised abscess
	(6)	Relapses
	(7)	Diabetes
	(8)	Pancreatic asthenia
Treat	(1)	Immediate exploratory laparotomy :
	Ind	(1) Doubtful diagnosis (2) Progressively acute signs (3) Generalised peritonitis (4) Abscess (5) Associated obstructive jaundice
	Contraind	(a) Lesser severity (b) Earlier acute stages (c) Marked collapse or cardiac weakness (d) Oliguria or anuria
Anæsth	General	Not spinal
Steps	(1)	Supra umbilical midline laparotomy
	Note	(a) Hæmorrhagic peritoneal fluid (b) Fat necrosis : Bender's test Intense blue on cupric acetate
	(2)	Isolation of the operative field
	(3)	Approach (a) Supragastric (b) Infragastric
	(4)	Evacuation of lesser sac fluid
	(5)	Incision of peritoneum over the head
	(6)	Blunt dissection of head from duodenum
	(7)	Open up retro pancreatic space
	(8)	Rubber drainage tube
	(A)	Retro pancreatic space . Bring it out : (a) Through the omentum (b) Without a kink

- (B) Lesser sac
- (C) Suprapubic if required

Tech (A) *Condition good*

- (1) Pancreatic decompression
- (2) Peritoneal toilet
- (3) Cholecystostomy
- (4) Drainage
 - (a) Retro pancreatic
 - (b) Lesser sac
 - (c) Suprapubic

(B) *Condition bad*

- (1) Drainage of lesser sac
- (2) Suprapubic drainage

(II) **Conservative treatment**

↓ **Delayed surgical interference**

Tech (A) **Conservative treatment**

- (a) Plenty of fluids by mouth and rectum
- (b) Subcutaneous and intravenous saline
- (c) Stimulants and ephedrine
 - When B P is low
- (d) Peristaltics
- (e) **Morphine and atropine**

↓ (B) **Surgical interference**

Ind Omental abscess

Tech Open by resect on of twelfth rib

- Post treat
- (a) Keep the retro pancreatic tube for 6 days
 - (b) Diet
 - (α) Pancreatised food
 - (β) Withhold fats

Post compl (1) **Burst abdomen**

Path Digestion of the wound
By pancreatic ferments

Clinic Falling apart of incisional margins

Treat Paraffin molle + 2% Hcl

(2) **Skin irritation**

Path Irritation by pancreatic and biliary discharge

Clinic Excoriated skin

Treat Emollients with 2% Hcl

(3) **Splenic and mesenteric thrombo phlebitis**

(4) **Relapses** Due to

- (a) Acute or sub acute recurrences
- (b) Gall stones
- (c) Old spasms
- (d) Duodenal ulcer

(5) **Pancreatic asthenia**

Time 2nd to 9th post operative day

- Clinic (a) Mask-like face with cyanosis
 (b) Debility, wasting
 (c) Anorexia, salivation, vomiting
 (d) Drawling voice
 (e) Circulatory depression: B. P. —

- Treat. (1) Blood transfusion
 (2) Pancreatic extracts

(6) **Pancreatic or biliary fistula**

(2) **SUB-ACUTE PANCREATITIS**

- Path: (A) **Milder acute pancreatitis**
 (B) **Local sequela of acute pancreatitis**

- Clinic: (a) Signs of acute pancreatitis (See above)
 ↓ (b) **Omental bursitis:**
 (a) Localisation of signs and symptoms
 ↓ (β) **Epigastric retrogastric tumour**

Treat: **Drainage:** Of the lesser cavity

(3) **CHRONIC PANCREATITIS**

Etio: Biliary lithiasis or sepsis

- Path (a) Chronic retrojection of bile
 or (b) Ascending lymphatic sepsis
 or (c) Pancreatic calculi
 or (d) Direct extension from peptic ulcer

- Morb. anat. (1) Interstitial interlobular
 (2) Interacinar → diabetes

- Clinic types (1) **Obstructive jaundice:**
 (a) Persistent, progressive, painless
 (b) Gall bladder +
 (c) Liver +
 (2) **Gall stone syndrome:**
 (a) Biliary colic with jaundice
 ↓ (b) Post operative recurrence of symptoms
 (3) **Recurrent epigastric pain**
 (4) **Chronic dyspepsia**
 (5) **Debility with diabetes:**
 (a) Progressive loss of weight
 + (b) Glycosuria and glycaemia
 (6) **Latent**

- Signs (a) Enlarged pancreatic head
 (b) Enlarged gall bladder
 (c) Enlarged liver

- Laboratory (A) **Defective external secretion:**
 (a) **Azotorrhœa:** Kashwado
 Undigested nuclei in fœces
 (b) **Steatorrhœa:**
 Undigested fat in fœces

- (c) Failure of starch digestion
- (d) Coope's test
Undigested meat in faeces
- (e) Sahli's test
Salol \rightarrow no salicyluric acid

(B) **Defective internal secretion :**

- (a) Glycosuria
- (b) Diminished sugar tolerance
- (c) Loewi's mydriatic test

(C) **Pancreatic disintegration :**

- (a) Diastase index
- (b) Cammidge osazone crystals

- Diff diag
- (1) **Carcinoma head of the pancreas**
 - (2) **Carcinoma biliary duct**
 - (3) Causes of dyspepsia
 - (4) Causes of jaundice
 - (5) Diabetes

Treat : (1) **Operative :**

- Ind Local mass with or without jaundice
- Operative findings
- (a) Enlarged liver
 - (b) Enlarged gall bladder
 - (c) Enlarged pancreatic head
 - (d) Adhesions
- Tech (a) **Biliary drainage :**
- (A) External
 - (a) Cholecystostomy
 - (b) Choledochostomy
 - (B) Internal
 - (a) Cholecyst gastrostomy
 - (b) Cholecyst duodenostomy
 - (c) Cholecyst jejunostomy .
With loop anastomosis
- (b) **Treat biliary sepsis and lithiasis**
- (2) Pancreatic extract
 - (3) Insulin therapy

(IV) **PANCREATIC CALCULI :**

- Path Calcium carbonates
Calcium phosphates
- Site Head of the pancreas (occasionally along the ducts)
- Clinic (a) Chronic pancreatitis of the head
Jaundice
- (b) Stone colic
Pain + vomiting
- (c) X Rays
Good shadows
- Treat Removal

(V) PANCREATIC CYSTS:

Varieties (A) *True cysts.*

(1) Acinous :

- (a) Retention
- (b) Cystadenoma
- (c) Multicystic disease (congenital)

(2) Inter-acinous :

- (a) Lymphatic
- (b) Parasitic
- (c) Dermoid
- (d) Hæmorrhagic

(B) Pseudocysts

Path Encapsulation of extravasated fluid in

- (a) Omental bursa
- or (b) Peri pancreatic cellular tissues

(1) Intra-peritoneal :

- (a) Traumatic
- (b) Pancreatitic

(2) Retro-peritoneal :

- (a) Necrotic
- (b) New growth

Path . Presence of one or all of the pancreatic enzymes in fluid

Clinic : **Supra-umbilical cystic swelling :**

- (a) History of pancreatitis or epigastric trauma
- (b) Transmitting aortic pulsations

Compl . Pressure on common bile duct

↓ Obstructive jaundice

Treat (A) **Exploration :**

- (a) Supra gastric
- (b) Inter-gastrocolic
- (c) Mesocolic

↓ (B) **Treatment of the cyst :**

(a) Drainage :

- (a) **Posterior :** Left sub costal space
Outer border of erector spinae

(b) Anterior

(b) Marsupialisation**(c) Enucleation**

Points (1) **Do not aspirate a pancreatic cyst**

(2) Save superior mesenteric artery

Post. treat Protective dressings

1) PANCREATIC FISTULA:

Etio (a) Trauma

(b) Operation

(c) Cyst drainage

- Clinic Discharge with skin irritation and digestion
 Compl (a) **Skin digestion**
 (b) Malnutrition
 Treat (A) **Protective dressings :**
 (1) 2% **hydrochloric acid** + paraffin
 (2) **Egg albumin**
 (3) (a) Durofix or mastisol application
 ↓ (b) Suction drain
 ↓ (c) Horse serum gauze pack around
 ↓ (d) Kaolin powder
 + (B) **Carbohydrate free diet**

(VII) NEW GROWTHS OF THE PANCREAS :

(1) ADENOMA OF THE PANCREAS

- Site Islet of Langerhans
 Path **Hyper-insulinism**
 Clinic (a) Recurrent attacks of
 Dreaminess + coma
 + (b) Intermediate neurasthenia
 (a) Irritability
 (β) Depression
 (γ) Weakness
 (δ) Insomnia
 Test **Intravenous 5 units of insulin :**
 ↓ (a) Attack of hyper insulinism
 (b) Failure of blood sugar to return to normal
 After two hours
 Treat (1) Pre operative
 High carbohydrate diet
 (2) Operative
 (a) Removal of pancreatic adenoma
 or (b) Excision of pancreatic tissue
 or (c) **Partial pancreatectomy**

(2) CARCINOMA PANCREAS

- Etio Men of 40
 Site Head of the pancreas
 Path (a) Encephaloid
 (b) Scirrhus
 Microscop (1) Spheroidal acinar
 (2) Columnar ductal
 (3) Islets of Langerhans
 Clinic (1) **Biliary type :**
 (a) Progressive permanent persist obstruc.
 Yellow → olive green → grey jaundice
 (b) Gall bladder +
 (c) Liver +

- (2) **Portal type :**
Ascites
- (3) **Alimentary type :**
Pyloric obstruction syndrome
- (4) **General type :**
Marked cachexia
- (5) **Painful type :**
Constant, deep seated, epigastric pain
- Signs
 - (a) Hard, nodular, fixed, epigastric tumour
 - (b) X Rays filling defects on barium meal
 - (c) Laboratory signs of deficient external secretion (See above)
- Diff diag
 - (1) Gall stones and cholecystitis
 - (2) Chronic pancreatitis
 - (3) Carcinoma bile duct
 - (4) Carcinoma pylorus
 - (5) Any cause of cachexia
 - (6) Other causes of obstructive jaundice
- Treat **Internal biliary drainage :**
 - (A) Cholecyst
 - (a) Gastrostomy
 - or (b) Duodenostomy
 - or (c) Jejunostomy
 - With loop anastomosis
 - or + (B) Gastro enterostomy

(VIII) IMPORTANT POINTS

- (1) In acute pancreatitis an increase in the serum diastase is almost invariably present
- (2) After short circuit operations for carcinoma pancreas, 90% of the patients die within a year but they are relieved of pruritus, jaundice and pain
- (3) *Dusky cyanosis of the face and neck, due to protein metabolic toxemia is pathognomonic of acute pancreatitis*
- (4) *Fat necrosis and blood stained fluid in peritoneal cavity are pathognomonic of acute pancreatitis*
- (5) *Raised diastase index, lowered sugar tolerance and early leucocytosis upto 50,000 are characteristics of acute pancreatitis*
- (6) There are three stages of acute pancreatitis
 - (a) Oedema pain
 - (b) Necrosis intestinal obstruction syndrome
 - (c) Abscess epigastric tumour
- (7) In acute pancreatitis
 - (a) Pain and toxæmia are most prominent

- (b) Demonstration of specific ferments in serum and urine is of crucial importance
- (c) Urinary diastase is the most valuable indication.
- (8) In chronic pancreatitis, a high glucose content of the blood is an important piece of evidence.
- (9) Indications for immediate operation in acute pancreatitis
 - (a) Uncertain diagnosis
 - (b) Progressive course
 - (c) Peritonitis or abscess
 - (d) Ileus without improvement
 - + (e) Absence of circulatory failure
- (10) There are two views on treatment of acute pancreatitis
 - (a) Immediate operation
 - (b) Conservation → delayed operation
- (11) *Best evidence that the correct diagnosis is pancreatitis is a rise in the blood and urinary diastase*
- (12) A rise in blood sugar whilst the patient is fasting is of great importance in diagnosis of acute pancreatitis.
- (13) The first surgeon to remove pancreatic calculi was Capparelli in 1883, the first in England was Pearce Gould in 1891
- (14) *Acute pancreatitis*
 - (a) *Acute abdominal catastrophe*
 - (α) Intolerable pain
 - (β) Profound collapse
 - (γ) Absence of rigidity
 - (b) Cyanosis of face and neck
 - (c) Loewi's mydriatic test
 - (d) *Urine and blood diastase*
- (15) Pancreatic cyst
 - (a) Supra umbilical cystic swelling
 - (b) Transmitted pulsations.
- (16) *In all cases of pancreatitis, acute or chronic*
 Look for
 - (a) *Biliary sepsis*
 - (b) *Biliary stones*
- (17) Courvoisier's law
 - (A) Jaundice + large gall bladder
 No stone impaction
 - (B) Stone impaction
 - (a) Fluctuating jaundice
 - + (b) Impalpable gall bladder
 - (C) Permanent obstruction
 - (a) Progressive jaundice
 - + (b) Enlarged gall bladder
 - (D) Exceptions
 - (a) Impaction at the three ducts junction

- (b) Double impaction
 - (a) Cystic duct
 - + (β) Hepatic or common duct
 - (c) Ampullary impaction
 - (18) Ptyalism is sometimes a prominent feature in pancreatic asthenia and carcinoma.
 - (19) *Simple fasting may be the only sign of chronic pancreatitis*
 - (20) *Special complications of pancreatic operations*
 - (a) Burst abdomen
 - (b) Skin digestion
 - (c) Pancreatic asthenia
 - (21) Mishaps at the pancreatic operation
 - (a) Injury to superior mesenteric artery
 - (b) Thrombosis of splenic and mesenteric veins.
 - (22) *Carcinoma pancreas*
 - (a) Elderly age
 - (b) Persistent progressive jaundice
 - (c) Gall bladder +
 - (23) All pancreatic cysts present between stomach and transverse colon, being covered by gastro colic omentum
 - (24) Anastomosis of gall bladder to alimentary tract is the treatment in cases of pancreatic obstruction to the biliary ducts, malignant or non malignant
 - (25) Acute pancreatitis is due to infection which causes activation of trypsinogen within the substance of the gland, followed later by autolysis
 - (26) Main path of infection in acute pancreatitis is pancreatic duct
 - (27) Acute pancreatitis is due to acute retrojection of bile into pancreas due to
 - (a) Common termination of biliary and pancreatic ducts
 - + (b) Spasm of sphincter Oddi
 - or (c) Impaction of gall stones in the ampulla
 - (28) Presence of one or all the pancreatic ferments in the fluid from a fistula, cyst or peritoneum is an indication of its source from the pancreas
 - (29) *Insidious, progressive, persistent, painless jaundice with rapid emaciation and enlarged gall bladder in an elderly patient means carcinoma pancreas*
 - (30) Reason for Courvoisier
 - In biliary stones, chronic cholecystitis must have led to fibrosis of the gall bladder
-

CHAPTER XII

THE SPLEEN

(1) CONGENITAL ABNORMALITIES:

(1) MOBILE SPLEEN

Def	Abnormal mobility of a spleen to a varying extent
	(a) Mobile spleen
	(b) Wandering spleen
Etio	(a) Congenital absence of phrenico colic lig
	(b) Trauma to suspensory ligaments
	(c) Splenomegaly
	(d) Visceroptosis
Clinic	(1) Dyspepsia traction on stomach
	(2) Spleen
	(a) Palpable in abnormal situation
	+ (b) Loss of normal splenic dullness
	↓ (c) Reducible to normal site
Diff diag	(1) Kidney
	(a) Hydronephrosis
	(b) Polycystic kidney
	(2) Uterus
	(a) Pregnant uterus
	(b) Pedicled uterine fibroid
	(3) Pedicled ovarian cyst
	(4) Carcinoma stomach or colon
Compl	(a) Torsion of the splenic pedicle
	(α) Engorgement hypertrophy
	(β) Atrophy
	(γ) Strangulation
	(b) Dislocation fixation in abnormal site
	(c) Exposure to trauma
	(d) Implication of other organs in torsion
Treat	(A) Conservative
	Belt
	(B) Operative
	(a) Splenopexy
	(b) Splenectomy
	Ind (α) Torsion of the spleen
	(β) Splenomegaly
	(γ) Trauma to the spleen

(2) MICROSPLENIA

Small → absent spleen

(3) ACCESSORY SPLEEN

. Presence of small splenicules in

- (a) Splenic pedicle
- (b) Leno renal ligament
- (c) Gastro splenic ligament

(4) TRANSPOSITION OF SPLEEN

In association with general visceral transposition

(II) TRAUMA.

(1) RUPTURE OF THE SPLEEN

Etiology (A) Traumatic :

- (a) Direct
 - (a) Blows or kicks
 - (β) Run overs
 - (γ) Falls on projecting objects
- (b) Indirect
 - Twists

(B) Spontaneous :

- (a) Normal spleen
- (b) Splenomegaly
 - (a) Malaria
 - (β) Kala azar
 - (γ) Blood diseases

Pre disposition (1) Splenomegaly
(2) Mobile spleenPathology (a) Punctured
(b) Fissured
(c) Lacerated
(d) Torn partial avulsion
(e) Severed complete avulsion
(f) Pulped in run overs

Clinical (1) History of trauma

↓ (2) Shock

+ (3) Local syndrome :

(A) Absent

or (B) Local signs

- (a) Pain (a) Local
- (β) Left shoulder Kehr

(b) Tenderness

(c) Rigidity

(d) Fullness

(e) Dullness

+ (4) Haemoperitoneum :

(A) Signs of internal hæmorrhage :

(a) Pallor

(b) Restlessness

(c) Thirst

(d) Rising pulse and respirations

- + (B) **Signs of free fluid in peritoneum**
- + (C) **Ballance's sign:**
 - : (a) Local non shifting dullness
 - + (β) Shifting dullness in perit. cavity

↓ (5) **Stage of irritative peritonitis**

↓ (6) **Stage of paralytic ileus**

Path. types. (A) Fulminating:

- Path (a) Avulsion of the spleen
- ↓ (b) Acute hæmoperitoneum
- ↓ (c) Immediate death

(B) Acute:

- Path (a) Splenic fissure or laceration
- ↓ (b) Moderate hæmoperitoneum
- ↓ (c) Irritative peritonitis
- ↓ (d) Sequelæ
 - (α) Paralytic ileus
 - (β) Sepsis
 - (γ) Adhesions

(C) Delayed:

- Path (a) Sub capsular hæmorrhage
or Omental plug
or Clot seal
- ↓ (b) Latency for some days
- ↓ (c) Acute hæmoperitoneum

Clinic. types (A) Fulminating:

- Clinic (a) Trauma
- ↓ (b) Profound hæmorrhagic shock
- ↓ (c) Death

(B) Acute: Classical acute abdomen

- Clinic (a) Trauma
- + (b) Shock
- + (c) Local signs
- + (d) Hæmoperitoneum + Ballance's sign
- ↓ (e) Peritonitis

(C) Delayed:

- Clinic (a) Trauma
- + (b) Local signs
- ↓ (c) Apparent recovery
- ↓ (d) Acute hæmoperitoneum

(D) Spontaneous recovery:

- Clinic (a) Trauma
- + (b) Local signs
- ↓ (c) Recovery on expectant treatment

Treat Immediate exploratory laparotomy:

- (A) Exploration
- ↓ (B) Splenectomy
- ↓ (C) Peritoneal toilet

- (1) Preoper
 - (a) Antishock treatment
No intravenous saline
 - (b) Blood transfusion
 - (c) Local ice bag
- (2) Anaesth
 - (a) Local + chloroform
 - (b) Local + sodium etheran
- (3) Technique
 - (a) Incision
 - Midline supra umbilical
 - (1) Button hole explorative
 - ↓ (2) Enlarged if diag confirmed
 - ↓ (3) Additional transverse
 - If difficult access
 - (b) Exploration of the spleen
 - (a) Digital
 - (β) Visual
 - (c) Digital compression of splenic vessels
 - (d) Splenectomy
 - Clamp the splenic pedicle
 - (a) Bit by bit
 - (β) As near the spleen as possible
 - (γ) Transfix every clamp
 - (e) Peritoneal toilet
 - (f) Exploration of other viscera
 - (1) Splenic vein
 - (2) Liver
 - (3) Pancreas
 - (4) Alimentary canal
 - (5) Kidney
 - (g) 2 Pints of warm saline in peritoneum
 - (h) Closure
 - (i) Blood transfusion if necessary
 - (a) Auto (if no injury to hollow viscera)
 - (β) Homo
- (4) Post compl (See under Operations)

(2) STAB AND GUNSHOT WOUNDS

- (A) Same as rupture spleen
- + (D) Associated injury to
 - (a) Left pleura lung diaphragm
 - (b) Stomach intestines colon
 - (c) Left kidney

(III) SPLENOMEGALY

(A) SURGICAL SPLENECTOMY INDICATED

- (1) Blood diseases with splenomegaly

(1) SPLENIC ANÆMIA

- Syn
 - (a) Banti's disease
 - (b) Hepato lienal fibrosis

Eti	Adolescent males
Cause	Defective iron metabolism <ol style="list-style-type: none"> Defective intake Defective absorption Increased demand
Path.	<ol style="list-style-type: none"> Primary splenomegaly Portal cirrhosis ascites Anæmia Sclerosis and thrombo phlebitis of <ol style="list-style-type: none"> Splenic vein Portal vein
Morb anat	<ol style="list-style-type: none"> Dilatation of portal vascular bed Fibrosis + cellular decrease of spleen Obstructive factor
Path groups	<ol style="list-style-type: none"> Thrombocytopenic . Hæmorrhages Thrombocythæmic : Thrombosis
Clinic stages	<ol style="list-style-type: none"> Splenomegaly + anæmia : 5-10 years ↓ Enlarged liver + urobilinuria . 6-18 months ↓ Portal obstruction Ascites 2 years
	Banti's syndrome
	<ol style="list-style-type: none"> Splenomegaly Anæmia Leucopenia Initial hæmorrhages Ascites
	Initial symptoms
	<ol style="list-style-type: none"> Gradually developing weakness Enlarging abdomen Hæmatemesis
Compl	Recurrent gastro intestinal hæmorrhages
Treat	<ol style="list-style-type: none"> Massive doses of iron Blood transfusion Splenectomy
Contraind	<ol style="list-style-type: none"> Hepatic insufficiency Anæmia + + Ascites
	<ol style="list-style-type: none"> Palliative surgery <ol style="list-style-type: none"> Ligature of coronary vein For hæmatemesis Omentopexy For ascites
Post. Compl	<ol style="list-style-type: none"> Hæmorrhage thrombocytopenia Thrombosis . thrombocythæmia

- (1) Splenic vein
- (2) Portal vein
- (3) Mesenteric vein
- (c) Peritonitis
- (d) Liver failure

(2) VON JAKSCH ANÆMIA

- Def Secondary anæmia with splenomegaly
 Etio Infancy or childhood **3 9 years**
 Rickets and debility
- Clinic (1) Age 3-9 years
 (2) **Splenomegaly**
 (3) Liver enlargement slight
 (4) **Lymph gland enlargement**
 (5) Secondary anæmia
- Laboratory Leukæmic picture without leucocytosis
- Treat (a) Generous diet
 (b) Iron arsenic vitamins
 (c) Blood transfusions
 (d) Splenectomy if conservatism fails

(3) ACHOLURIC FAMILIAL JAUNDICE

- Def Hæmolytic disease affecting
 (a) Spleen
 ↓ (b) Liver
 + (c) Biliary passages
- Pa'h (A) **Congenital**
 Increased erythrocytic fragility
 (B) **Acquired**
 Splenic avidity for erythrocytes
 Hypersplenism
- Types (A) **Congenital**
 Etio Familial and hereditary
 Age Infancy or childhood
 Clinic More jaundiced than ill
 Prog Good
 (B) **Acquired**
 Age Adults
 Clinic More anæmic than jaundiced
 Prog Grave
- Clinic (1) **Splenomegaly + + +**
 (2) **Hæmolytic jaundice**
 Persistent non toxic
- Signs (1) **Stools normal**
 (2) Urine Amber brown
 Urobilin +
 Bile —

- (3) Blood . (a) Secondary anaemia
 (b) R.B.C. fragility +
 (c) Van den Bergh .
 (α) Direct negative
 (β) Indirect positive

Special . Crises or exacerbations :

- (a) Pyrexia with toxæmia
 (b) Acute anaemia
 (c) Deepening of jaundice
 (d) Tender, rapid splenomegaly
 (e) Wasting

Compl (1) Pigment cholelithiasis

- (2) Biliary sepsis
 (a) Cholecystitis
 (b) Cholangitis
 (3) Cirrhosis liver

Treat (A) Splenectomy

- (B) Exploration of biliary apparatus
 (C) Treatment of cholelithiasis

(4) PURPURA HÆMORRHAGICA

Def Non traumatic frequent recurrent wide spread hæmorrhages

- Path (a) Low platelet count**
 (b) Prolonged bleeding time
 (c) Normal clotting time

- Varieties (1) Purpura simplex**
 (2) Purpura rheumatica : Schonlein
 (3) Purpura abdominalis : Henoch
 (4) Purpura fulminans
 (5) Purpura hæmorrhagica : Werlhof

Syn Essen thrombocytopenic purpura

Def Idiopathic hæmorrhagic disease

- (a) Bleeding from
 (α) Muc mem.
 (β) Subcutaneous
 (b) Secondary anaemia
 (c) Thrombocytopenia
 (d) Prolonged bleeding time

EtiO Adolescent females

Clinic. types (A) Acute :

Severe, uncontrollable, dramatically sudden hæmorrhages .

- (a) External
 (b) Internal
 (c) Extravasations

(B) Chronic.

Milder recurrent attacks of hæmorrhage at irregular intervals with remissions and exacerbations

Symp	(a) Epistaxis (b) Hæmatemesis (c) Hæmaturia (d) Menorrhagia (e) Melæna (f) Hæmarthrosis (g) Hæmothorax (h) Hæmoperitoneum (i) Petechiæ
Diagnosis	(1) Low platelet count 50000 (2) Tourniquet test: Petechiæ (3) Prolonged bleeding time • 20-60 min (4) Normal clotting time (5) Failure of clot retraction
Diff diag	(1) Hæmophilia (2) Toxic hæmolytic purpura (3) Scurvy (4) Aplastic anæmia (5) Leukæmia (6) Rashes (a) Specific (b) Infectious
Treat	(A) Medical (1) Blood (a) Blood transfusion (b) Intramuscular auto blood (2) Radiotherapy (a) Radium (b) Deep X Rays (c) Ultra Violet Rays (3) Protein shock therapy (a) Antivenin (b) Horse-serum (c) Milk (d) Peptone (4) Coagulants (a) Coagulen-Ciba (b) Thromboplastin (c) Hæmoplastin (5) Diet Vit. B and C, Liver (6) Drugs (a) Salvarsan (b) Calcium + parathormone (c) Iron and arsenic (d) Glandular therapy

(B) **Surgical**: Excellent results

(1) **Splenectomy**

+ (2) Spleniculectomy

+ (3) Removal of septic foci

(5) **SPLENIC THROMBOPHLEBITIS**:

Varieties (A) **Primary**: Etiology unknown

(B) **Secondary**: To splenic anæmia

(a) Splenic anæmia: (See above)

↓ (b) Splenic or portal endophlebitis

↓ (c) Splenic or portal thrombosis

↓ (d) Splenomegaly

Treat **Splenectomy**:

Difficulties (a) Friable and tortuous veins

(b) Many adhesions

(II) *Portal cirrhotic splenomegaly*

Syndrome (A) **Liver cirrhosis**

+ (B) **Ascites**

↓ (C) **Splenomegaly**

Treat (1) **Splenectomy**: In early cases

+ (2) **Talma-Morison omentopexy**: In ascites

(III) *Protozoal splenomegaly*

(1) **MALARIAL SPLENOMEGALY**.

Etio Most common in tropics

Chnrc (1) Malaria past or present

(2) Splenomegaly

Compl Rupture (a) Accidental

(b) Medico legal

(c) Spontaneous

Treat Splenectomy

Ind (a) Rupture

(b) Very big size

(c) Undue mobility

(d) Torsion of the pedicle

(2) **EGYPTIAN SPLENOMEGALY**.

Syn Bilharzial splenomegaly

Def. Splenomegaly due to bilharzia Manson

Chnrc. Insidious onset

(a) First stage 2 weeks

Pyrexia

(b) Second stage 3 years

(a) Enlarged liver

+ (b) Enlarged spleen

(c) Third stage:

- (a) Atrophic cirrhosis liver
- (β) Splenomegaly
- (γ) Ascites

Sign: Eosinophilia

Treat: (A) Medical:

- (a) Full dose of carbon tetrachlor.
- ↓ (b) Full course of tartar emetic
- ↓ (c) Six inj of neosalvarsan

(B) Surgical:

Pre oper. Antipneumonia vaccine

Anæsth. Spinal

Technique. (a) Splenectomy

(b) Omentopexy if ascites

(3) GUMMA OF THE SPLEEN

(4) HYDATID OF THE SPLEEN.

Treat. (a) Splenectomy

(b) Marsupialisation

(IV) Abscess of the spleen.

Etiology: (a) Acute infectious fever

(b) Pyæmia

(c) Acute infective endocarditis

(d) Tropical infections

Clinic (1) General, septic toxæmia

(2) Local. (a) Left hypochondritis

- (a) Pain (1) Local
- (2) Kehr

(β) Tenderness

(γ) Rigidity

(b) Local pitting œdema

(3) Regional: left basal signs

Signs: (a) Blood examination

(a) Count

(β) Widal

(γ) Culture

(b) X Rays. diaphragmatic abnormality

(c) Splenic puncture. (On operation table)

(a) Preliminary to incision

(β) 10th interspace mid axillary line

Treat: (A) Splenectomy

(B) Splenotomy and drainage:

Ind: (a) Difficult splenectomy

(b) Bad general condition

(c) Localising signs

(V) *New growths of the spleen :*(1) **CYSTS OF THE SPLEEN :**

- (a) Simple blood cyst: single
- (b) Simple lymph cyst
- (c) Simple serous cyst } : small, multiple
- (d) Dermoid cyst
- (e) Polycystic spleen :
: Association with kidney and liver
- (f) Hydatid cyst
- Treat. (1) Splenectomy
- (2) Marsupialisation

(2) **GAUCHER'S DISEASE :**

Etio : Sex : females

: Age : (a) Acute : children

(b) Chronic : adults

: Congenital and familial

Path : Disturbances in lipid metabolism with deposition of kersin in Gaucher cells of reticulo endothelial system

- Clinic
- (1) Insidious onset
 - (2) **Splenomegaly :**
 - (a) Large size
 - (b) Earliest sign
 - (3) Liver enlargement
 - (4) **Conjunctival thickening :**
 - : Pinguecula
 - (5) **Hæmachromatosis :**
 - : Symmetrical pigmentation of legs
 - (6) Bone changes :
 - (a) Sclerosis : (a) General
 - (b) Local
 - (b) Pathological fractures
 - (7) Nervous symptoms : tremors
 - (8) Internal secretion disturbances

- Compl.
- (1) Cachexia
 - (2) Anæmia
 - (3) Intercurrent diseases

- Diff diag :
- (a) Splenic anæmia
 - (b) Acholuric jaundice
 - (c) Biliary cirrhosis
 - (d) Von Jaksch
 - (e) Leukæmia

Treat : Splenectomy

(3) **MISCELLANEOUS GROWTHS :**

- (A) Angioma : cavernous
- (B) Sarcoma
- (C) Fibroma
- (D) Lymphoma
- (E) Lymphangioma

(VI) *Aneurysm of splenic artery.*

- Clinic (1) Violent, sudden, hæmoperitoneum
 or (2) Aneurysm + splenomegaly
 (A) Pulsating epigastric tumour
 + (B) Splenomegaly
- Treat (1) Proximal ligature
 ↓ (2) Excision of the aneurysm sac
 + (3) Splenectomy

(B) MEDICAL SPLENOMEGALY

SPLENECTOMY CONTRA INDICATED

(I) *Circulatory splenomegaly*

- (1) Splenic vein thrombosis
 (2) Decompensated heart
 (3) Liver cirrhosis
 (4) Infarction of the spleen endocarditis

(II) *Infective splenomegaly*

- (1) Typhoid
 (2) Kala azar
 (3) Malaria

(III) *Blood diseases splenomegaly*

- (1) Pernicious anæmia
 (2) Polycythæmia rubra
 (3) Leukocytæmia
 (a) Spleno medullary
 (b) Lymphatic
 (4) Hodgkin lymphadenoma

(IV) *Chronic infections splenomegaly*

- (1) Tuberculosis (a) Miliary
 (b) Cold abscess

(2) Syphilis

- Path (a) Congenital diffuse splenomegaly
 (b) Secondary diffuse interstitial splenitis
 (c) Tertiary (a) Interstitial splenitis
 (b) Gumma of the spleen

Diff diag Splenic anæmia

Treat Antisyphilitic
 (3) Actinomycosis

(V) *Metabolic splenomegaly*

(1) Rickets

(2) Amyloid disease

Etio Chronic pyococcal sepsis

Path Perivascular deposit of amyloid

- Clinic (a) Chronic septic focus
 (b) Splenomegaly spleen deposition
 (c) Enlarged liver liver deposition

- (d) Diarrhœa intestinal deposition
- (e) Albuminuria kidney deposition

(VI) *Peri splenitis*

Associated with Pick's multiple serositis

(IV) OPERATIONS ON THE SPLEEN

(1) SPLENIC PUNCTURE

Ind Kala azar

Prep Calcium lactate 30 grs

- (a) Night before
- (b) Morning before
- (c) Just after

Position Flat on back with hands under head

Site (a) 10th intercostal space
+ (b) Mid axillary line

N B Holding of breath during the puncture

(2) SPLENECTOMY

Ind (A) *Congenital anomalies of position*

- (a) Thoracic spleen diaphragmatic hernia
- (b) **Mobile spleen**
 - (α) Wandering spleen
 - (β) Floating spleen
 - (γ) Torsion of the pedicle

(B) *Trauma*

(a) **Rupture**

- (α) Direct trauma
 - (1) Penetrating wound
 - (2) Laceration
 - (3) Prolapse through a wound
- (β) Indirect trauma
- (γ) Spontaneous rupture

(b) **Stab and gunshot wounds**

(C) *Focus of disease*

- (a) Splenic arterial aneurysm
- (b) Abscess
- (c) Cysts
 - (α) Hydatid
 - (β) Blood serous lymphatic
 - (γ) Dermoid

(d) *New growths*

- (α) Innocent
 - (1) Fibroma
 - (2) Lymphoma
 - (3) Lymphangioma
 - (4) Hæmangioma
- (β) Malignant
 - (1) Sarcoma
 - (2) Carcinoma

(e) Bacterial or protozoan splenomegaly:

- (1) T. B.
- (2) Gumma
- (3) Malaria
- (4) Kala-azar
- (5) Egyptian or bilharzial

(f) Gaucher's disease

(D) *Portal back pressure* :

- (a) Splenic anæmia : Banti
- (b) Hepatic cirrhosis
- (c) Thrombo-phlebitic splenomegaly
- (d) Idiopathic splenomegaly

(E) *Hypersplenism* :

: Extensive destruction of r. b. cs

- (a) Thrombocytopenic purpura hæmorrhag.
- (b) Acholuric jaundice

(F) *Von Jaksch*

Contraind : (1) Very poor general condition
 (2) Technical difficulties :
 (a) Adhesions
 (b) Friability

Pre oper : (1) Blood transfusion
 (Before, during, and — or after operation)
 (2) Stomach aspiration with Ryle tube in situ

Tech. (1) **Incisions :**

(A) **Midline supra-umbilical :**

Ind : General exploration is easy

(B) **L shaped :**

Ind : Good access after general exploration

(C) **Left paramedian :**

Ind : Diagnosis certain

(D) **Trans-rectus muscle-split :**

Ind. Easy approach

Contraind : Post operative rectus weakness

Tech : Split at junction of middle and inner third of left rectus

(E) **Left subcostal**

Ind : Obesity

(2) **Exploration of abdomen**

(3) **Mobilisation of spleen :**

- (a) Exploration and palpation of spleen
- (b) Ligature and division of adhesions
- (c) Transfixion and ligature of gastro-splenic lig
 - (a) Close to the spleen
 - (b) Away from the stomach

(d) Mobilisation of the spleen :

: If there are dense adhesions, make an incision in the parietal peritoneum anterior to the adhesions and mobilise the spleen by separating both layers up to the splenic pedicle

(e) Division of post. leaf of lienorenal ligament**(f) Delivery of the spleen out of the wound****Ligature of the spleen pedicle :****(a) Strip off the pancreatic tail****(b) Pack the splenic bed****(c) Clamp the pedicle with three clamps**

: Under direct vision

(d) Ligatures .

(a) Whole pedicle at most medial clamp

(b) Individual vessel ligature at middle clamp

(c) When the vessels are large and friable, ligate 2 or 3 vessels with a thick (No. 2) chromic catgut, and not the whole pedicle in a single ligature

(5) Excision of the spleen :

(a) Remove the pack

(b) Look for hæmorrhage

(c) Omentise the pedicle

(6) Peritoneal toilet**(7) Exploration of other viscera****(8) Closure****Difficulties : (1) Bad general condition :**

(a) Do not operate

(b) Anti-shock measures

(c) Delicate handling

(2) Inaccessibility :

Causes : *(a) Rigid abdomen*

(b) Badly placed incision

(c) Deep splenic fossa

Treat : *(1) Good anaesthesia*

(2) Extension of incision

(3) Adhesions :

Treat : *(a) Splenic arterial control*

(b) Packing

(c) Technique mentioned under mobilisation of spleen

(d) Abandonment of operation :

: After tying splenic artery

(4) Blood accumulation :

Causes : *(a) Pre operative*

(b) Slipped pedicle

- Treat (1) Control the splenic artery
(2) Peritoneal toilet

(5) **Too big spleen**

- Treat (1) Tie the splenic artery first
↓ (2) Squeeze the spleen and wait
↓ (3) Tie the pedicle

(6) **Friable pedicle and spleen**

- Causes (a) Splenic thrombo-phlebitis
(b) Sepsis
(c) Delayed hæmorrhage from rupture

- Treat (1) Ligature of individual vessels
(2) Ligatures not too tight or loose

(3) **ADDITIONAL SURGICAL PROCEDURES**

- (A) **Pre operative temporary ligation of splenic artery**
(Med Ann 1940)

- Ind (a) Too big spleen
(b) Too many adhesions
(c) Profuse hæmorrhage expected

- Tech (a) Small left paramedian incision
(b) Retraction downwards of the stomach
(c) Tear through gastro hepatic ligament
(d) Pass a rubber tube round the arterial origin
(e) Splenectomy

Through the transverse incision

- (f) Release the artery

After tying the pedicle

- (B) **Permanent ligation of splenic artery**

- Ind (a) Difficult splenectomy
(b) Splenic arterial aneurysm

- (C) **Radiotherapy**

- Ind (1) Leukæmias

- Result (a) Temporary improvement
↓ (b) Recurrence

- Compl (a) Over irradiation
↓ (b) Marrow failure

- (2) Polycythæmia

- (3) Lymphadenoma

Post compl (1) Shock

- Etiol (a) Trauma
(b) Hæmorrhage

- Path (a) Primary
(b) Delayed

- Treat (1) Anti shock measures

- (a) Pre operative

No intravenous saline if hæmor

- (b) Operative

- (a) Saline 2 pints in peritoneum

- (b) Auto blood transfusion

- (c) Post operative :
 (α) Intravenous saline
 (β) Blood transfusion

(2) Hæmorrhage :

(A) Operative .

- Causes : (α) Slipped pedicle
 (b) Friable pedicle :
 · (α) Delayed ruptures
 (β) Spontaneous ruptures
 (c) Adhesions
 (d) Abnormal bleeding time

- Treat (1) Temp. ligature of splenic artery
 (2) Follow and tie the slipped pedicle
 (3) Individual vessel ligatures
 (4) Packing

(B) Post operative

- Causes . (α) Slipped ligature
 (b) Sepsis
 (c) Predigested ligatures
 · Pancreatic ferments

Treat Re exploration

(3) Hæmatemesis :

- Causes . (α) Thrombocytopenia
 (b) Gastric congestion

- Treat (1) Conservative
 ↓ (2) Coronary vein ligature

(4) Acute gastric dilatation :

Treat Ryle tube drainage

(5) Paralytic ileus

(6) Chest complications :

- (α) Diaphragm
 (α) Hiccup
 (β) Sub phrenic abscess
 (b) Pleural effusion

Treat Repeated aspirations

- (c) Lungs . pneumonia, collapse, œdema

(7) Pancreatic trauma :

- (α) Burst abdomen
 (b) Peritoneal effusion + fat necrosis

(8) Vein thrombosis :

- Sites . (α) Splenic
 (b) Portal
 (c) Mesenteric
 (d) Femoral

- Cause (1) Thrombocythæmia
 (2) Thrombo phlebitis :
 : In splenic anæmia

(9) Splenic asthenia :

Time About 10th day

Clinic Irritability + pyrexia + emaciation

Treat Arsenic

(10) Burst abdomen :

Causes (a) Pancreatic trauma

(b) Debility

(c) Technical error

Continuous sutures for muscles

(d) Abnormal early strain cough

(e) Sepsis of the wound

(11) Peritoneal effusion :

Causes (1) Pancreatic trauma

(2) Peritonitis

(12) Intestinal obstruction :

Cause Adhesions

(13) Liver death .

Hepatic insufficiency

(14) Ventral hernia**(V) IMPORTANT POINTS**

- (1) *In splenic rupture, remember*
 - (a) *Temporary digital compression of splenic vessels immediately on opening the abdomen*
 - (b) *No intravenous saline before the control of the source of internal hæmorrhage*
- (2) Most common causes of splenic rupture
 - (a) Fall from a height
 - (b) Motor car accidents
- (3) *Spleen is the only viscus in the abdomen, which is liable to laceration due to slight external injury because of*
 - (a) Splenomegaly
 - (b) Normal friability
- (4) *A case of hæmo peritoneum seen on the 2nd or 3rd day simulates acute inflammatory peritonitis with rigidity, free fluid etc.*
- (5) *Never forget to examine for pallor the conjunctivæ, tongue and nails of every patient with acute abdomen, to exclude acute hæmo peritoneum*
- (6) Bluish red discoloration of the peritoneum, seen on exploratory incision, presages hæmo peritoneum
- (7) Friable pedicle appears to be the peculiar terror of delayed cases of rupture spleen
- (8) Splenic pedicle
 - (a) Avoid cutting out of a ligature
 - (b) Avoid slipped ligature.

- (9) Riegues of Breslau performed the first successful splenectomy for rupture in 1893.
- (10) Hollowed hands are the most efficient apparatus for removal of fragmented clot.
- (11) Disadvantages of radiation of spleen :
 - (a) Bad effect on blood
 - (b) Adhesions
- (12) In splenic anæmia, splenectomy does not improve the expectation of life, nor prevent the progress of the cirrhosis of liver or of the anæmia or the occurrence of hæmatemesis, and there is therefore no logical reason for performing it as a routine. (Med. Ann. 1939).
- (13) In all cases of splenectomies for splenomegaly, examine splenic and portal veins for phlebitis or thrombosis before proceeding to excise the spleen
- (14) *In purpura hæmorrhagica :*
 - (a) *Coagulation time is normal*
 - (b) *Bleeding time is prolonged*
 - (c) *Low platelet count.*
- (15) *Hæmolytic acholuric jaundice :*
 - (A) Features.
 - (a) Anæmia
 - (b) Acholuric jaundice
 - (c) Splenomegaly
 - (d) Blood.
 - (a) Reticulocytosis
 - (β) *R.B.C. friability +*
 - (e) Crises
 - (B) Complication. cholelithiasis
- (16) Splenectomy is not indicated in hæmolytic jaundice where R.B.Cs are not more fragile.
- (17) *Blood transfusion is accompanied by hæmolysis in acholuric jaundice.*
- (18) *Incisions for splenectomy :*
 - (A) *Linea alba or L : for ruptured spleen*
 - (B) *Left trans rectus vertical*
. For routine splenectomy
 - (C) *Left Kocher or subcostal .*
. In obese patients
- (19) *Take care not to injure pancreatic tail in ligature of splenic pedicle.*
- (20) Splenic puncture
 Ind: Kala azar
 Site: 10th intercostal space in mid axillary line
 N.B.: Patient to hold the breath during puncture.
- (21) High platelet count presages post operative venous thrombosis, low count warns about hæmorrhage.

- (22) *In every spleen case, examine the blood for .*
- (a) General picture :
 - (α) Total and differential count of leucocytes
 - (β) R.B.Cs and hæmoglobin
 - (b) Special items :
 - (α) *Coagulation time*
 - (β) *Bleeding time*
 - (γ) *Platelet count :*
 - (1) High : thrombosis
 - (2) Low . hæmorrhage
 - (δ) *R.B.C fragility*
- (23) It is better to tie the pedicle vessels individually, and as near the spleen as possible, arteries being tied before the veins.
- (24) *Rupture spleen and ectopic gestation are the two most common causes of hæmo peritoneum*
- (25) In stab wounds of the spleen, make a systematic search of other organs
- (26) *Most common indications for splenectomy .*
- (1) *Rupture*
 - (2) Blood diseases
 - (a) Banti
 - (b) Acholuric jaundice
 - (c) *Purpura hæmorrhagica*
 - (3) Portal cirrhosis
- (27) *In every splenectomy, explore .*
- (a) *Liver*
 - (b) *Biliary apparatus*
 - (c) *Pancreas*
- (28) In hæmo peritoneum, if spleen does not show any tear, examine the liver, if it is negative, examine the splenic pedicle, in women, do not forget ectopic gestation
- (29) *Common difficulties in splenectomy*
- (a) Bad general condition
 - (b) Inaccessibility
 - (c) Adhesions
 - (d) Friability
-

CHAPTER XIII

(I) THE PERITONEUM

(I) CONGENITAL ABNORMALITIES:

(1) ABNORMAL LENGTH OF MESENTERIES:

(A) Short or absent mesentery :

. Fixed or immobile viscera

(B) Long mesentery :

(a) Mobile, floating or wandering viscera

(b) Visceroptosis

(c) Volvulus

(2) ABNORMAL BANDS AND MEMBRANES.

(A) Cystico-duodenal band :

Gall bladder to pylorus

(B) Mesocolic band of Pringle :

Mesocolon to duodeno-jejunal flexure

(C) Lane's first kink :

2 ft 4 in from ileo caecal valve to ovary

(D) Jackson's membrane :

Over the caecum and ascending colon

(E) Payr's membrane :

Over the splenic flexure

(F) Toldt's membrane :

Over the pelvic colon

(3) UNOBLITERATED PROCESSES

(A) Congenital hydrocele :

Of the vaginal or funicular process

(B) Congenital hernia :

(a) Inguinal

(b) Femoral

(c) Umbilical

(4) ABNORMAL MOBILITY

: Sliding hernia

(II) TRAUMA:

(1) CONTUSIONS AND WOUNDS.

Etio. (a) Blows

(b) Falls

(c) Run overs

(d) Stab wounds

(e) Gunshot wounds

(f) Bull gores

Types . (A) Closed :

- (a) **Simple :** No visceral injury
- (b) **Complicated :** Visceral injury

(B) Open :

- (a) No injury + no prolapse
- (b) No injury + prolapse
- (c) Injury + no prolapse
- (d) Injury + prolapse

Path : (1) Aseptic peritonitis :

- (a) Contusion
- (b) Hæmorrhage
- (c) Aseptic extravasations
 - (a) Gastric contents
 - (β) Bile
 - (γ) Urine

(2) Septic peritonitis :

- (A) *Primary*.
 - (a) From within :
Perforations, ruptures
 - (b) From without
Stab wounds, bull gores
- (B) *Secondary*
Superimposed on aseptic peritonitis

Clinic (1) History**(2) Traumatic shock :**

- (a) Mental
- (b) Peritoneal
- (c) Hæmorrhagic
- (d) Splanchnic

(3) Local examination :

- (A) Open wound without or with prolapse
Do not probe
Always explore
- (B) Contusion
Tenderness + rigidity

(4) Traumatic peritonitis :

- (A) Hæmorrhagic
- (B) Perforative

Compl . (1) Shock : Ordinary or splanchnic**(2) Internal hæmorrhage :**

Hæmo peritoneum

(3) Visceral injuries :

- (a) Lacerations
- (b) Perforations
- (c) Ruptures
- (d) Prolapse

(4) **Peritonitis :**

- (a) Contusional
- (b) Extravasational
- (c) Perforative

(5) **Paralytic ileus**

- Sequelæ : (1) Sepsis : (a) Wound
 (b) Abdominal wall
 (c) Peritoneal cavity :
 (a) Local
 (β) General
- (2) Adhesions → intestinal obstruction
- (3) Fistulæ
- (4) Ventral hernia

Treat : (See further)

(2) **INTRA-PERITONEAL HÆMORRHAGE :**

Syn : Hæmo-peritoneum

Etio· (A) **Trauma :** To solid vascular organs

- (a) Accidental
- (b) Post operative

(B) **Vascular erosions :**

- (a) Ruptured ectopic gestation
- (b) Ruptured aneurysm

Path. (1) Sources : (a) **Spleen**
 (b) Liver
 (c) **Ectopic gestation**
 (d) Vessels

↓ (2) Irritative peritonitis

Clinic : (A) **Stage of shock :**

- (a) Traumatic shock
- (b) Local tenderness and spasm

↓ (B) **Stage of hæmorrhage :**

- (a) General signs of hæmorrhage .
 (a) **Pallor**
 (β) Rising pulse and resp
 (γ) Thirst
- (b) **Fluid in the peritoneum :**
 (a) Shifting dullness
 (β) Thrill
- (c) Local tenderness and spasm

↓ (C) **Stage of irritative peritonitis :**

- (a) General signs of hæmorrhage
- + (b) Acute diffuse peritonitis

Diff. diag : (1) Acute respiratory crisis

(2) Acute abdominal crisis

(3) Acute shock

- Compl. (1) **Acute diffuse peritonitis :**
 (a) Aseptic
 ↓ (b) Septic
 (2) **Sepsis :**
 (a) Local abscesses
 (b) Septic peritonitis
 (3) **Adhesions** → Intestinal obstruction
 (4) **Hæmorrhagic cyst**
- Treat (A) **Immediate exploration**
 ↓ (B) Treatment of the source
 ↓ (C) Peritoneal toilet
 ↓ (D) Closure without or with drainage

(3) RETRO-PERITONEAL HÆMORRHAGE :

- Etio (1) Trauma to kidney
 (2) Fracture of pelvis
 (3) Contusions of the posterior abd wall
 (4) Trauma to the mesentery
- Clinic (A) Local swelling
 (B) Contusion
- Compl (1) Splanchnic shock
 (2) Paralytic ileus
 (3) Abscess
 (4) Retro peritoneal cellulitis

(4) PERITONEAL EXTRAVASATIONS :

- Etio (1) Injuries to the viscera
 (a) Solid
 (b) Hollow
 (2) Injuries to the blood vessels
 (3) Traumatic inflammation
- Path *Nature of extravasation*
 (1) **Serous :** Irritative peritonitis
 (2) **Purulent :** Septic peritonitis
 (3) **Bile-stained :**
 (a) Trauma to biliary passages
 (b) Trauma to duodenum
 (4) **Intestinal :** Fæculent or faecal
 (a) Enteric trauma
 (b) Colonic trauma
 (5) **Blood-stained or hæmorrhagic :**
 (a) Trauma to solid vascular organs
 (b) Trauma to vessels
 (6) **Urinary :**
 : Intra peritoneal rupture of the bladder
- Clinic (1) History of injury
 (2) Peritoneal shock

- (3) Free fluid in the peritoneum
- (4) Acute spreading peritonitis
- (5) Special features
 - (a) Bile peritoneum
 - (a) Bradycardia
 - (β) Icterus
 - (b) Hæmo peritoneum
 - General signs of hæmorrhage
 - (c) Urine peritoneum
 - Urinary difficulties
- Compl (1) Sepsis
- (2) Adhesions
- Treat (1) Exploration
- ↓ (2) Treatment of the source
- ↓ (3) Peritoneal toilet
- ↓ (4) Drainage (a) Late cases
- (b) Sepsis

Treatment of abdominal trauma

- (1) Anti shock measures
- (2) Careful examination
 - (A) External injury
 - Always explore immediately
 - (B) Internal injury
 - (a) Suspected hæmo peritoneum
 - Explore immediately
 - (b) Suspected rupture or perforation
 - Explore immediately
 - (c) Suspected contusion only
 - (a) Expectant
 - ↓ (β) Operative if progressive signs
- (3) Some points
 - (a) Catheterise to eliminate bladder trauma
 - (b) Examine
 - (a) Chest
 - (β) Spine
 - (γ) Skull
 - (δ) Limbs
 - (c) Better to explore than to be in doubt
- (4) Exploratory laparotomy
 - (A) *Immediate*
 - Ind (a) Open wound
 - With or without prolapse
 - (b) Gunshot wound
 - (c) Suspected hæmo peritoneum
 - (d) Suspected visceral rupture
 - (B) *Delayed*
 - (a) Contusion with local rigidity
 - + (b) Progressive signs
 - In spite of 2 hours expectant treat

- Tech : (1) Small, midline supra-umbilical incision
 ↓ (2) Diagnosis of the condition
 (A) If nothing abnormal : close
 (B) If abnormal . enlarge the incision
 ↓ (3) Exploration :
 (A) *Hemo-peritoneum* :
 (a) Spleen with its pedicle
 (b) Liver
 (c) Kidneys
 (d) Mesentery
 (e) Big vessels
 (B) *Gas or alimentary contents*
 (a) Stomach
 (b) Transverse colon
 (c) Small intestines
 (d) Duodenum
 (e) Other parts of the colon
 (C) *Bile stained fluid*
 (a) Gall bladder
 (b) Biliary ducts
 (c) Duodenum
 (D) *Urine*
 : Urinary bladder
 (E) *Mesenteric or omental tears*
 ↓ (4) Treatment of primary focus
 (A) *Spleen or splenic vein* .
 (a) Manual control of the splenic pedicle
 ↓ (b) Ligature of splenic pedicle
 ↓ (c) Splenectomy
 (B) *Liver* :
 (a) Hogarth Pringle's method
 ↓ (b) Treatment .
 (a) Packing . (1) Turpentine
 (2) Snake venom
 (β) Suture
 (C) *Pancreas* :
 Diag (a) Blood-stained exudate
 (β) Fat necrosis
 Tech (a) Infra gastric approach
 (b) Lesser bursa toilet
 (c) Treatment : (α) Suture
 + (β) Lesser sac drain
 Compl : Burst abdomen
 (D) *Biliary apparatus* .
 Diag : Bile-stained fluid

Tech (a) Gall bladder

(α) Cholecystostomy

(β) Cholecystectomy

(b) Bile ducts

Clinic (α) Gradual ascitis

(β) Jaundice

Tech (1) Drainage

or (2) End to-end anastomosis

or (3) Ligature both ends

↓ Cholecyst-gastrostomy

(E) *Stomach*

Diag Gastric contents

Tech Suture

(F) *Intestines Rupture*

Diag (a) Local tenderness and spasm

(b) Position and direction of the wound

Tech (a) *Explore* (α) Duodenum

(β) *Duodeno-jejunal flexure*

(γ) Jejunum

(α) Ileum

(δ) Colon

↓ (b) *Treatment*

(1) Duodenum

(α) Extra peritoneal drain

(β) Intra peritoneal

(1) Suture

↓ (2) Gastro jejunostomy

↓ (3) Morison drainage

(γ) Complete

(1) Close both ends

↓ (2) Post. gastro-jejunostomy

↓ (3) Morison drain

(2) Duodeno jejunal flexure

(α) Close the duodenal end

(β) Implant the jejunal end
Into third part of duodenum

(3) Small Intestines

(α) Small punctures

Purse-string

or (β) Large punctures

Double layer suture

In the transverse axis

+ (γ) Omental patch

(4) Large Intestines

(α) Intra-peritoneal

(1) Suture

+ (2) Omental graft

+ (3) Drain

(β) Extra-peritoneal

Diag Emphysema of the flank

Compl Retroperitonitis

Treat (1) Colostomy
(2) Free local drain

↓ (c) *Explore other portions of the gut*

(G) *Mesentery*

(1) Laceration

Treat (a) Longitudinal tears
Suture

(b) Parallel or transverse tears

(a) Small suture

(3) More than 2" or non-viable intest.
Resection of the intestine

Tech Ligatures over hæmostats on oppo margins

(2) *Hæmatoma*

Treat (a) Aspiration

or (b) Incision → evacuation → l gate source

or (c) Resection of the intestine

Compl (1) Paralytic ileus

(2) Gangrene gut

↓ (5) Peritoneal toilet Dry mopping

↓ (6) Drainage In

(a) Frankly septic cases

(b) Potential sepsis

(c) Irritating extravasations

Treatment of penetrating wounds of the abdomen

Immediate exploratory laparotomy

Contraind (1) Shock B P under 80

(2) Favourable progress after 36 hours

(3) Sports shot gun wounds

Tech (1) Large Incision

Include and excise the wound

↓ (2) Open the peritoneum

Fresh knife

↓ (3) Explore Both surfaces

(A) *Stomach and duodenum*

(a) Suture

or (b) Resection

or (c) Partial gastrectomy

(B) *Small intestines*

(a) Explore the whole length

Segment by segment

↓ (b) Treat the rents

(a) Purse-string

or (3) Transverse sutures

or (Y) Resection gut

Ind (1) Multiple perforations

(3) Suspicious viability

(C) *Mesentery*

(a) *Hæmatoma*

(1) Aspirate

or (2) Evacuate and tie the source

or (3) Resection gut

(3) Tears

(1) Close

or (2) Resection gut

(D) *Colon*

Compl Retro peritoneal cellulitis

Diag (1) Retroperitoneal juxta colic hæmatoma

(2) Emphysema of the flank

Tech (a) Retro peritoneal approach

↓ (b) Double row suture

↓ (c) Proximal colostomy

↓ (d) Retro peritoneal drainage

(E) *Spleen and pancreas*

(See above)

(F) *Liver*

(a) Excise the wound of entrance

(b) Explore the viscera

Midline incision

(c) Access to liver

Trans pleural route

↓ (4) Closure of the abdomen

Treatment of abdomino thoracic injuries

(A) *Thoracic route*

(a) Incision along one of the lower ribs
includes the wound

↓ (b) Removal of fractured ribs

↓ (c) Exposure of pleural cavity
Separate instruments

↓ (d) *Treatment of thoracic trauma*

↓ (e) Enlargement of diaphragmatic wound upto 6"

↓ (f) *Treatment of abdominal trauma*

↓ (g) Closure of the diaphragm

↓ (h) Suture of the lung to the diaphragm

↓ (i) Closure of the chest without drainage

(B) *Abdominal route*

Ind (1) Abdominal signs

(2) Thoracic wound small

Tech (1) Exploratory laparotomy

↓ (2) *Treatment of abdominal focus*

↓ (3) *Attention to thorax*

Treatment of shot gun wounds

(1) *Masterly inactivity*

(a) Fowler's position

(b) Absolute starvation for 5 days

(c) Continuous intravenous glucose-saline

(d) Intramuscular

(a) Anti-gas-gangrene serum

(3) Anti tetanus serum

(e) Large doses of morphia

(f) Observation chart

↓ (2) Exploration :

Ind. (a) Failure of conservatism

(b) Shot-gun at close range

(III) INFLAMMATIONS OF THE PERITONEUM:

Etio. types - (1) *Infective or septic* :

Sources : (A) **Alimentary tract** :

Path. (a) Ruptures and perforations

(b) Transmigration

Bact. (1) Streptococcus

(2) B. coli

(3) Anaerobic bacilli

(B) **Biliary tract** :

Path. Ruptures and wounds

Bact : B coli

(C) **Fallopian tubes** :

Path. (a) Salpingitis

↓ (b) Pelvic abscess

↓ (c) Peritonitis

Bact (a) Gonococcus

(b) Streptococcus

(D) **Hæmatogenous** :

Path. Septicæmia

Bact : (a) Streptococcus

(b) Pneumococcus

(E) **Penetrating wounds** :

Path. (a) Infection carried from outside in

(b) Prolapse → infection

Bact Pyococci

(2) *Irritative or aseptic* :

Sources. (A) **Hæmoperitoneum** :

Etio (a) Traumatic, spleen or liver

(b) Ectopic gestation

(c) Ruptured aneurysm

Clinic. (1) General signs of **internal hæmorrh.**

+ (2) Fluid in the peritoneum

(B) **Gastric juice** :

Etio. (a) Gastric trauma

(b) Gastric perforation

Clinic : Perforative peritonitis

(C) **Sterile bile** :

Etio : (a) Rupture or perforation.

(a) Biliary apparatus

(b) Duodenum

(b) Transudation of bile :

Cause : (a) Regurgitant pancreas ferments
↓ (β) Permeable gall bladder wall

Clinic : (a) Right hypochondritis

↓ (b) Irritative peritonitis

+ (c) **Bradycardia**+ (d) **Icterus**

(D) Pancreatic juice :

Etio : (1) Pancreatic trauma

(2) Acute pancreatitis

Path : (a) Fat necrosis

(b) Blood stained fluid

Clinic : (1) Acute peritonitis · epigastric
↓ general

With : (a) Acute pain

(b) Acute shock

(c) **Cyanosis of the face**(d) **Loewi's mydriasis**

↓ (2) Epigastric tumour . pseudocyst

(E) Sterile urine :

Etio · Rupture bladder

Clinic : (a) Irritative peritonitis

· Pelvic → general

(b) History of fracture pelvis

(c) Absent micturition

+ (d) Non distended bladder

(F) Ruptured cyst :

(a) Ovarian

(b) Mesenteric

(c) Pancreatic

(d) Hydatid

Pathology . Peritoneal irritation without infection

Compl : (1) Adhesions

(2) Infective peritonitis

(A) ACUTE PERITONITIS :

Bacteriology : of peritonitis in general :

(1) **B. coli communis**(2) **Streptococcus ; staphylococcus**(3) **B. Tuberculosis**(4) **Pneumococcus**(5) **Gonococcus**(6) **Anærobic bacilli**(7) **B Pyocyaneus**

Etio : of acute peritonitis :

(1) *Secondary spreading peritonitis :*

Syn : Focal peritonitis

Def : Perit. spreading from an obvious local focus

or (4) Deep tenderness and rigidity:

In regions away from operative area

(5) **Paralytic ileus**

(6) Profound toxic shock

(4) *Traumatic spreading peritonitis:*

• (See under Trauma)

Pathology : of acute spreading peritonitis .

(1) **Exudation:**

(a) Serous or sero fibrinous

(b) Sero purulent

(c) Purulent

(d) Blood stained

(2) **Adhesions:**

(a) Fibrinous

(b) Fibrous

(3) **Inflammatory edema**

(4) **Thrombosis of vessels**

(5) **Abscesses**

(6) **Retro-peritonitis**

(7) **Paralytic ileus**

(8) **Failure of splanchnic circulation:**

- Peritoneal shock

(9) **Portal congestion**

(10) **Peritoneal toxæmia:**

(a) B. Welch

(b) Toxic proteoses and amino acids

(11) Presence of gas (a) Perforations

(b) Mixed infections

Course, (A) Fulminating

(B) Acute spreading

(C) Acute localised

Clinic. features of acute peritonitis

Varieties (A) Localised: Focal

Confined to a region of primary focus.

(a) Appendicitis

(b) Salpingitis

(B) Localised → spreading:

(a) Localised signs

↓ (b) Progressive extension of area

(a) Direct extension

(β) Gravity

(r) Venous or lymph channels

(6) Rupture of protective wall

(C) Generalised :

1. A letter was received from the Dept.

the 1990s, the number of people in the world who are illiterate has increased from 750 million to 850 million. The number of illiterate people in the world is expected to increase to 900 million by the year 2015. The number of illiterate people in the world is expected to increase to 950 million by the year 2020. The number of illiterate people in the world is expected to increase to 1 billion by the year 2025. The number of illiterate people in the world is expected to increase to 1.1 billion by the year 2030. The number of illiterate people in the world is expected to increase to 1.2 billion by the year 2035. The number of illiterate people in the world is expected to increase to 1.3 billion by the year 2040. The number of illiterate people in the world is expected to increase to 1.4 billion by the year 2045. The number of illiterate people in the world is expected to increase to 1.5 billion by the year 2050. The number of illiterate people in the world is expected to increase to 1.6 billion by the year 2055. The number of illiterate people in the world is expected to increase to 1.7 billion by the year 2060. The number of illiterate people in the world is expected to increase to 1.8 billion by the year 2065. The number of illiterate people in the world is expected to increase to 1.9 billion by the year 2070. The number of illiterate people in the world is expected to increase to 2 billion by the year 2075. The number of illiterate people in the world is expected to increase to 2.1 billion by the year 2080. The number of illiterate people in the world is expected to increase to 2.2 billion by the year 2085. The number of illiterate people in the world is expected to increase to 2.3 billion by the year 2090. The number of illiterate people in the world is expected to increase to 2.4 billion by the year 2095. The number of illiterate people in the world is expected to increase to 2.5 billion by the year 2100.

(D) Post operative :

- (a) Absence of pain, tenderness and rigidity
- (b) Profound toxæmia and paralytic ileus

Stages : (1) Initial stage of peritonism : First 2 hours

- (a) Pain
- (b) Shock
- (c) Vomiting
- (d) Rigidity of abdomen

↓ (2) Latent stage of illusion : 2-6 hours

- (a) Pulse nearly normal
- (b) Rigidity absent

↓ (3) Stage of inflammation : 6 hours to 2-3 days

- (a) Pain + tenderness + rigidity
- (b) Rising pulse and temperature
- (c) Peritonitic vomiting

↓ (4) Stage of paralytic ileus :

- (a) Acute intestinal paralysis :
 - (a) Distension
 - (β) Absolute constipation
 - (γ) Regurgitant vomiting
- (b) Rising pulse

↓ (5) Stage of toxic shock :

- (a) Acute paralytic ileus
- (b) Subnormal temperature
- (c) Rising thready pulse
- (d) Facies hippocratica + cyanosis

Symptoms and signs .**(1) Pain .**

- (a) **Visceral pain :**
 - (a) Colicky
 - (β) Round about umbilicus
- ↓ (b) **Local pain :**
 - Due to regional parietal peritonitis
- ↓ (c) **Diffuse pain :**
 - All over the abdomen
 - Due to diffuse peritoneal irritation
- + (d) **Referred pain :**
 - (a) Right shoulder in cholecystitis
 - (β) Kehr's sign in spleen
- (e) **Disappearance of pain :**
 - (a) Sudden perforation
 - (β) Gradual . toxæmia

(2) Vomiting .

- (a) **Peritonism :**
 - Initial . unrepented

- ↓ (b) **Peritonitis :**
Small, repeated, greenish
- ↓ (c) **Paralytic stomach or ileus :**
Regurgitant, copious, repeated
- (3) *Shock*
(α) **Initial :**
Due to peritoneal irritation
- ↓ (b) **Absent :**
(α) Period of illusion
(β) Period of inflammatory peritonitis
- ↓ (c) **Toxic :**
(α) Period of paralytic ileus
(β) Peritoneal toxæmia
- (4) *Pulse*
(a) Peritonism **Normal or slow**
↓ (b) Period of illusion **Normal**
↓ (c) Inflammatory peritonitis
Rising but full and steady
↓ (d) Ileus stage
Running, thready
↓ (e) Toxic stage
Imperceptible
- (5) *Temperature*
(a) Peritonism **Subnormal**
↓ (b) Period of illusion **Normal**
↓ (c) Inflammatory peritonitis **Hypernormal**
↓ (d) Ileus stage } **Subnormal**
↓ (e) Toxic stage }
- (6) *Dehydration*
(a) Appears with inflammatory stage
↓ (b) Worse in ileus stage
↓ (c) Profound in toxic stage
- (7) *Toxæmia*
(a) Appears with inflam stage **sthenic**
↓ (b) Worse in ileus stage
↓ (c) Profound in toxic stage **asthenic**
- (8) *Hiccup*
Diaphragmatic irritation
(α) Upper abdominitis
(β) Ileus stage
(γ) Toxæmia
(δ) Basal thoracic lesions
- (9) *Abdominal wall .*
(A) *Inspection .*

- (a) Inflammatory stage :
 Retraction + Immobility
- (b) Paralytic stage .
 Distension

(B) *Palpation*

(a) **Tenderness :**

- Varieties : (a) Local
 (β) Rebound
 (γ) Pain in affected organ
 By . Pressure on uninvolved part
- (1) Present in :
 - (α) **Initial stage**
 - (β) **Illusional stage**
 - (γ) **Inflammatory stage**
 - (2) Absent in
 - (α) **Intestinal obstruction**
 - (β) **Toxic stage**
 - (γ) **Post-oper peritonitis**

(b) **Rigidity :**

- (α) **Marked in perforative perit.**
- (β) **Absent in :**
 - (1) **Period of illusion**
 - (2) **Paralytic ileus**
 - (3) **Toxic stage**
 - (4) **Post-oper. peritonitis**
 - (5) **Visceral obstructions**
 - (6) **Acute pancreatitis**
 - (7) **Pelvic peritonitis**

(c) **Distension :**

- Paralytic ileus
 (a) Local
 (β) General

(d) **Mass or tumour :**

- (a) **Inflammatory œdema**
- (b) **Hypertrophy**
- (c) **Abcess**
- (d) **Local distension**

(C) *Thrill* .

- (a) *Peritoneal fluid*
- (b) *Large cyst hydatid*

(D) *Percussion*

- (a) *Fluid shifting dullness*
- (b) *Paralytic ileus tympanitis*
- (c) *Perforations*
 . *Obliteration of liver dullness*
- (d) *Abcesses local dullness*

(E) Auscultation :

- (a) Borborygmi .
 . Mechanical int. obstruction
- (b) Dead silence : paralytic ileus

(10) Rectal examination :**(1) Tenderness :**

- (a) Right appendicitis
- (b) Left salpingitis
- (c) Anterior Douglas pouch
- (d) Posterior

(2) Mass or bogginess : Peri rectal inflam**(3) Palpable viscera****(4) Ballooning : Low colonic obstruction****(5) Mucus, blood or pus :
 Pelvic abscess proctitis****(11) Special examinations :****(A) Blood : Leucocytosis
 Cultures****(B) Peritoneal paracentesis****(C) Exploratory laparotomy***Differential diagnosis of acute peritonitis .***(A) Referred acute abdomen :**

- (1) Heart : Angina
- (2) Chest : Basal troubles
- (3) Spine : Pott's disease
- (4) Scrotum : Torsion testis

(B) Medical acute abdomen :

- (1) Abdominal influenza
- (2) Typhoid tympanitis
- (3) Ascites
- (4) Uræmic ileus
- (5) Tabetic crises
- (6) Henoch's purpura abdominalis
- (7) Various colics :
 (a) Intestinal
- (b) Biliary
- (c) Urinary
- (d) Uterine
- (8) Pick's disease multiple serositis

(C) Retro-peritoneal inflammations :

- (1) Kidney and ureter
- (2) External iliac lymphadenitis
- (3) Retro peritoneal cellulitis

*Differential diagnosis of causes of acute peritonitis :***(1) Traumatic peritonitis :**

- (a) Ruptures
- (b) Stabs
- (c) Prolapses
- (2) **Irritative peritonitis :**
 - (a) Gastric juice
 - (b) Bile
 - (c) Pancreatic ferments
 - (d) Urine
 - (e) Blood
- (3) **Inflammatory peritonitis :**
 - (a) Acute appendicitis
 - (b) Acute cholecystitis
 - (c) Acute salpingitis
 - (d) Acute pancreatitis
 - (e) Meckel's diverticulitis
- (4) **Perforative peritonitis :**
 - (a) Gastric perforation
 - (b) Duodenal perforation
 - (c) Typhoid perforation
 - (d) Appendicular perforation
 - (e) Gangrenous perforation : (strangulation)
- (5) **Obstructive peritonitis :**
 - (a) Strangulated hernia
 - (b) Bands
 - (c) Volvulus
 - (d) Acute intussusception
 - (e) Ileus verminosus
 - (f) Paralytic ileus
- (6) **Primary peritonitis :**
 - (a) Streptococcal
 - (b) Pneumococcal
 - (c) Gonococcal
 - (d) Tuberculous
 - (e) Anærobic

Complications of acute peritonitis

- (1) **Pulmonary :** (a) Pleurisy → empyema
(b) Pneumonia
- (2) **Peritoneal toxæmia**
- (3) **Intestinal obstruction :**
 - (a) Acute . (α) Immediate paralytic ileus
(β) Superimposed on chronic
 - (b) Chronic . due to adhesions and bands
- (4) **Fæcal fistulæ :**
 - (a) Trauma to alimentary viscera

- (b) Ulceration or erosion of alimentary vis
 - (α) Tuberculous
 - (β) Carcinomatous
 - (γ) Drainage tube pressure
- (5) **Residual abscesses :**
 - (a) Subphrenic
 - (b) Iliac
 - (c) Pelvic
- (6) **Pylephlebitis and portal pyæmia**
- (7) **Parotitis**

Treatment of acute peritonitis

(A) *Observe conservative treatment*

- Ind (a) **Localised stationary peritonitis :**
In pre operative time
- (b) **Localising peritoneal abscess :**
Till firmly isolated
- (c) **Diffuse grave peritonitis :**
Till patient rallies
- (d) **Post-operative period**

Tech (1) *Ochsner Sherren treatment*

- (a) **High or low Fowler's position :**
Advant (α) Better respirations
(β) Pelvic accumulations
(γ) Better micturition
(δ) Abdominal relaxation
- (b) **Oral attention :**
(α) No food or fluids or purges
(β) **Gargles and sialagogues**
(γ) Gastric suction drain
- (c) **Rectal :**
(α) **No large enema**
(β) Rectal tap water or saline.
Continuous Murphy's drip
- (d) **Intravenous :**
(α) Saline *isotonic* or *hypertonic*
(β) Glucose
(γ) Chemo therapy
Soluseptasine, iodine etc.
(δ) Blood transfusion
- (e) **Intramuscular : Sera**
(α) Anti gas gangrene 10 c.cs
Once a day for five days
(β) Streptococcal
(γ) Pneumococcal
(δ) B coli

(f) Subcutaneous :**(a) Morphia :**

- Ind (1) In grave diffuse perit.
 (2) Pre operative
 (3) Post operative

- Contraind (a) Doubtful diagnosis
 (b) Doubtful treatment
 (c) Children and seniles
 (d) Chest complications
 (e) Advanced pregnancy

(β) Cardiac stimulants :

Camphor in oil, cardiozol

(2) Observation chart . (Hourly)**(a) Pulse :**

- (α) Rate slow → normal
 ↓ rising → running

- (β) Volume
 Good → thready → bad

(b) Temperature :

- (α) Rise
 (β) Fall gradual or sudden

(γ) Relation to the pulse :

Prognosis bad if indirect variation

(c) Respiration :

- (α) Rate rising
 (β) Accompaniments cough
 (γ) Relation to pulse and temp

(d) Pain :

- (α) Gradual abatement
 (β) Continuance
 (γ) Worsening
 (δ) Sudden disappearance
 ? perforation

(u) Change in character

- (a) Colicky
 ↓ (b) Stabbing
 ↓ (c) Continuous

(e) Vomiting :

- (α) Continuance
 (β) New appearance
 (γ) Change in character .
 (1) Small mouthfuls
 (2) Regurgitant, copious
 (3) Stercoraceous

- (f) **Hyperæsthesia :**
 - : In Sherren's triangle
 - (α) Presence on admission
 - (β) Continuance
 - (γ) Disappearance :
 - (1) Gradual
 - (2) Sudden
- (g) **Tenderness :** Degree & extent
 - (a) Abating
 - (b) Stationary
 - (c) Increasing
- (h) **Rigidity :** Extent
 - (a) Abating
 - (β) Stationary
 - (γ) Extending
 - (δ) Giving place to distension
 - (u) Sudden extensive appearance
 - ? Perforation
- (i) **Distension :** Extent
 - (a) Local
 - (β) Extending
 - (γ) Decreasing
- (j) **Stools :**
 - (a) Absolute constipation
 - (β) Diarrhoea
 - (γ) Passage of mucus
- (k) **Dehydration + toxæmia :**
 - (a) Facies Hippocratica
 - (β) Toxic shock
 - (1) Cyanosis
 - (2) Circulatory failure
 - (3) Mental asthenia
- (l) **Blood :** Total & different. count
 - . Steadily increasing leucocytosis
- (m) **Signs of complications :**
 - (1) **Pulmonary :**
 - (a) Respirations
 - (β) Temperature
 - (2) **Residual abscesses :**
 - (a) Localising signs
 - (β) Temperature
 - (3) **Portal pyæmia :**
 - (a) Rigors + fever + sweats
 - (β) Tender large liver
 - (γ) Jaundice
 - (4) **Parotitis :**
 - (a) Local signs
 - (β) Temperature

(B) Surgical treatment :

- Ind :** (1) Early cases of localised perit. focus :
: **Within 48 hours** of onset
(2) Failure of observo conservative treat.
(3) Localised abscess
(4) Diffuse peritonitis :
(a) After disappearance of shock
(b) After localisation
(5) **Intestinal strangulations**
(6) **Alimentary perforations**
(7) **Hæmo-peritoneum : Progressive**
- Pre oper** (a) **Intravenous glucose-saline :**
Unless (α) Hæmo peritoneum
(β) Respiratory compl
(γ) Cardiac complications
(b) Sedative
Morphia ; scopolamine, omnopon
(c) Stomach tube with siphon drain
Ind (α) Obstructive abdomen
(β) Acute gastric dilatation
(γ) Prominent vomiting
(d) Passage of a catheter
(e) Preparation of the abdomen
(α) Clavicles to mid thighs
(β) Lumbar spine. for spinal
(f) Blood transfusion if necessary
- Anæsth .** (1) Spinal
(2) Local with light general
(3) General
- Technique** **Exploratory laparotomy :**
Incision (1) Right paramedian para-umbilical
If no pre operative diagnosis
(2) Local
- Procedures** (A) **Condition desperate .**
: **Blind suprapubic drain :**
Ind (a) Desperate diffuse peritonitis :
Due to perforated appendix
(b) Pelvic abscess
Anæsth : Local novocain
Tech (1) Small suprapubic incision
(2) Peritoneal opening by finger
(3) Drainage tube on hæmostat
- (B) **Co idition bad**
: (1) **Blind cæco or enterostomy**
+ (2) **Suprapubic drainage**

(C) Condition fair**(1) Treatment of local focus****↓ (2) Peritoneal toilet :**

- (a) Siphon aspiration
- (b) Delicate sponging

↓ (3) Peritoneal drainage :**Ind (a) Local focus :**

- (a) Existing
- (β) Potential
- (1) Incomplet removed
- (δ) Not removed

- (b) Localised abscess
- (c) Purulent exudate
- (d) Time more than 12 hours
- (e) Perforations
- (f) Strangulations
- (g) Potential hæmorrhage
- (h) Potential leaking

- (a) Bile
- (β) Intestinal contents
- (1) Urine

Sites (1) Upto the focus

- (2) Supra pubic
- (3) Paracolic gutters
- (4) Morison's pouch
- (5) Inter parietal

Tech (1) Not too soft or hard

- (2) Not too narrow or wide
- (3) Bevelled end
- (4) Lateral hole not too big
- (5) Straight course out
- (6) Not to press against

- (a) Primary focus
- (b) Intestines
- (c) Anastomosis
- (d) Vessels

Procedures for different etiologies**(A) Pneumococcal peritonitis****(1) Conservative**

- (a) High Fowler
- (b) M & B 693
- (c) Intravenous glucose-saline
- (d) Drip blood transfusion
- (e) Anti-pneumococcal serum

(2) Surgical

- (a) Diagnosis uncertain
- (a) Gridiron appendix exploration
- ↓ (2) Suprapubic stab drain

- (b) Diagnosis established
 - Drainage (a) Suprapubic
 - (β) Vaginal
- (B) *Post parturition or abortion peritonitis*
 - (1) Pelvic
 - (a) *Ochsner-Sherren*
 - ↓ (b) Posterior colpotomy drainage
 - (2) General
 - Tech (i) Right paramedian subumbilical incision
 - ↓ (b) Isolation of pelvis
 - ↓ (c) Opening of abscess
 - ↓ (d) Drainage
 - (α) Abscess
 - (β) Peritoneal cavity
 - (1) In front of uterus
 - (2) Douglas
- Post treat Sulphonamides
- (C) *Streptococcal peritonitis*
 - (a) Suprapubic drainage
 - (b) Continuous intravenous infusion
 - (c) Anti-streptococcal serum
 - (d) Sulphonamides
- (D) *Gonococcal Peritonitis*
 - (1) In a child
 - (a) Diagnosis certain
 - Conservative
 - (b) Diagnosis uncertain
 - (α) Laparotomy
 - ↓ (β) Exploration
 - ↓ (γ) Evacuation + drainage
 - (2) In adult (males Pelvic → diffuse)
 - Conservative
 - (a) Serum therapy
 - (b) Blood transfusions
 - (c) Intravenous olive oil emulsion
 - (d) Sulphonamides
- (F) *Acute tuberculous peritonitis*
 - (1) Exploratory laparotomy
 - ↓ (2) Evacuation of fluid or peritoneal toilet
 - ↓ (3) Treatment of local focus if any
 - ↓ (4) Closure without drainage
- (F) *Post-operative peritonitis*
 - (a) Treat the toxæmia
 - (1) Intramuscular anti gas-gangrene
 - (2) Intravenous saline
 - (b) Treat the paralytic ileus
 - (See under Intestines)
 - (c) Re-open the abdomen
 - (1) Treat the cause

- + (2) Caecostomy
- + (3) Supra pubic drain
- (G) *Post traumatic peritonitis*
(See under Trauma above)
- (H) *Focal peritonitis*
(See under different organs)

After treatment of surgical interference for acute peritonitis

(A) **Prevention and treatment of paralytic ileus**

(1) *First 24 hours*

- (1) **Gastric suction drain**
- (2) **Morphia** Small repeated doses
- (3) **Heat to the abdomen**
- (4) **Avoidance of oral and rectal food**
- (5) **Intravenous glucose saline**

(b) *Between 24 and 48 hours*

- (1) **Morphia** 1/6 gr six hourly
- (2) **Acetyl choline** 0.1 gm hourly
- ↓ (3) Ox bile → turpentine enema

(c) *End of 48 hours*

- (1) **Intravenous hypertonic saline**
500 ccs of 10% saline
- ↓ (2) **Fiemā**
- ↓ (3) **Spinal anaesthesia**
- ↓ (4) **Enterostomy** under local

(B) **Treatment of peritoneal toxæmia**

- (1) **Lowler's position**
- (2) **Fluids**
 - (a) **Subcutaneous**
 - (b) **Intravenous**
- (3) **Blood transfusion**
- (4) **Intravenous 10% olive oil emulsion**
- (5) **Chemotherapy intravenous**
 - (a) **Soluseptasine**
 - (b) **Iodine**
 - (c) **Mercurochrome**
- (6) **Sera**
 - (a) **Antigangrene**
10 ccs intramuscular for 5 days
 - (b) **Anti streptococcal**
 - (c) **Anti pneumococcal**
 - (d) **B coli antiserum**
- (7) **Bacteriophage**
30-60 ccs through drainage tube

(C) **Mouth and chest hygiene**

- (1) **Mouth**
Gargles and sialagogues

- (2) Chest :
: Anti pneumonic preventive treat.

(D) Drainage tube :

- (1) *Removal*.
(a) Prophylactic remove in 48 hours
(b) Focal drain : 3-5 days
(c) If discharge as soon as it is less
(2) *Treatment during retention*
(a) Daily rotation
(b) Shorten gradually
(3) *Complications*
(a) Paralytic ileus • Local
(b) Fæcal fistula
(c) Adhesions
(d) Strangulation
(e) Ventral hernia
(f) Secondary hæmorrhage

(B) PERITONEAL ABSCESES

- Def. (1) **Secondary abscess** :
Complicating a local septic focus
(2) **Residual abscess** :
Left behind a diffuse peritonitis

Sites (1) **Iliac fossa** •

- (a) Right
(b) Left

(2) **Pelvis**

- (3) Subphrenic
(4) Central

Clinic (1) General toxæmia
: **Raised temperature**

- (2) Local
(a) Localised peritonitis
Pain + tenderness + rigidity

↓ (b) **Mass**

↓ (c) **Abscess**

(3) Regional
: **Irritation syndrome** :

- (a) Diaphragmatic irritation
(b) Pelvic visceral irritation
(a) Proctitis
(β) Cystitis

(4) **Special**

- (a) X Rays diaphragmatic abnormality
(b) Blood leucocytosis > 20,000

Compl. Rupture → (a) Peritonitis
(b) Fistulæ. (α) External
(β) Internal

Treat Immediate evacuation and drainage :

After complete localisation

Without contamination of general cavity

- Tech** (A) Abscess adherent to anterior abdominal wall
Incision directly over
- (B) Deep abscesses adherent to post abd wall
Indirect retroperitoneal route
- (C) Deep central abscess
- (1) (a) Laparotomy
↓ (b) Isolation of the abscess
↓ (c) Aspiration of pus
↓ (d) Water tight drainage tube
- or (2) (a) Laparotomy
↓ (b) Leave the drain upto the abscess wall
↓ (c) Wait for 48 hours
↓ (d) Open by sinus forceps through the tube (if no auto burst)

(1) ILIAC ABSCESS

(A) Right iliac abscess

- Causes** (a) **Intraperitoneal**
- (α) Acute suppurative **appendicitis**
- (β) Meckel's diverticulitis
- (γ) Caecal (1) Tuberculosis
(2) Carcinoma
(3) Actinomycosis
- (b) **Retroperitoneal**
- (α) Ext iliac lymphadenitis
- (β) **Psoas abscess**
- (γ) **Retroperitoneal appendicitis**

- Varieties** (1) **Secondary** To local focus (appendicitis)
- (2) Residual duodenal perforation
- (3) Post operative

- Extensions** (1) **Lumbar**
- (2) **Pelvis**
- (3) Horse shoe
- (4) Subphrenic
- (5) Retroperitoneal

(B) Left iliac abscess

- Causes** (a) Appendicitis
- (b) Carcinoma sigmoid
- (c) Diverticulitis
- (d) Iliac lymphadenitis
- (e) Psoas abscess

Treatment of iliac abscess

- Anæsth** (a) Regional
- (b) Spinal
- (c) General

Steps. (A) Intraperitoneal abscess :

Incision : (a) 2" trans inwards from ant sup spine

↓ (b) Direct approach

If peritoneum adherent to abscess

or (b) Retroperitoneal approach .

If perit movable over the abscess

↓ (c) Search for possible extensions

(α) Lumbar

(β) Pelvis

↓ (d) ? Appendicectomy

Only if appendix lies free in cavity

↓ (e) Drainage

(α) Through external angle of incision

(β) Counter incision in the loin

(1) Pelvic (1) Rectal

(2) Vaginal

(3) Suprapubic

(B) Retroperitoneal abscess :Incision Just above and parallel to outer half of the
Poupart ligament**(3) SUBPHRENIC ABSCESS**

Def Collection of pus under the diaphragm

Varieties (A) **Intra-peritoneal :**(a) **Right :**

(α) Postero superior

(β) Antero superior

(γ) Inferior : Morrison

(b) **Left :**

(α) Superior

(β) Antero inferior

(γ) Postero inferior lesser sac

(B) Retro-peritoneal(a) **Posterior : Perinephric**

(b) Anterior

Etiology (1) Gastric perforations
 (2) Duodenal perforations
 (3) Gall bladder inflammations
 (4) Appendicitis
 (5) Pancreatitis
 (6) Perinephric abscess

Path *Routes of infection*

(1) Direct
 (2) Intra peritoneal . from peptic perforation
 (3) Lymphatic : from appendix, gall bladder

- (4) Blood stream
 (a) Portal pyæmia
 (b) Systemic pyæmia
- (5) Retro peritoneal
 From pancreas kidney, appendix

Anatomy

<i>Site</i>	<i>Space</i>	<i>Etiology</i>
Right Intra peritoneal Postero superior	<i>Between</i> (a) Diaphragm (b) Right lobe liver Below rt lateral lig	(a) Pyloro duoden (b) Gall bladder
Right Intra peritoneal Antero superior	<i>Between</i> (a) Diaphragm (b) Right lobe liver Above rt lateral lig	(a) Pyloro duoden (b) Gall bladder
Right Intra peritoneal Inferior	Right renal pouch	(a) Pyloro duoden (b) Gall bladder (c) Rt iliac fossa
Left Intra peritoneal Superior	<i>Between</i> (a) Diaphragm (b) Left lobe liver Above left lat lig	Stomach
Left Intra peritoneal Antero inferior	<i>Between</i> (a) Liver (b) Stomach	Gastric perforation
Left Intra peritoneal Postero inferior	Lesser sac	(a) Stomach (b) Pancreas (c) Gastro jejunum
Retro peritoneal posterior	Phrenico lumbar	(a) Retro append (b) Perinephric abs (c) Diverticulitis (d) Pancreatitis
Retro peritoneal anterior	In front of coronary ligament	Umbilicus

Common causes (1) Appendicular

- Causes (a) Delayed appendicectomy
 (b) Failure to drain
- Routes (a) Intra peritoneal paracolic
 (b) Retro peritoneal
 (c) Lymphatic

(2) **Gastro duodenal :**

Cause . Perforation

Clinic . Abscess may contain gas

(3) **Hepato-biliary :**

Causes (a) Amoebic abscess

(b) Cholecystitis

Suppurative and perforative

Clinical types . (A) **Sthenic :**

(a) Initial acute intra peritoneal focus

↓ (b) Acute upper peritonitis

↓ (c) Acute abscess

+ (d) General sthenic toxæmia

(B) **Asthenic :**

(a) Initial intra peritoneal focus

↓ (b) Subsidence

↓ (c) Insidious non acute upper peritonitis

+ (d) General asthenic toxæmia

(C) **Latent :**

General sepsis with no local signs

(D) **Post-operative :**

(a) Operation for an abdominal focus

↓ (b) Latency

↓ (c) General sepsis with or without local signs

Clinic (A) **Stage of subphrenitis .**(1) **Pyrexia**(2) *Pain relation to respiration*(3) **Diaphragmatic irritation**

(a) Dry cough

(b) Hiccup

(c) Dyspnoea

(4) **Local tenderness**

(a) Anterior phrenic spot

10th rib in mid clavicular line

(b) Posterior phrenic spot

Post end of last inter costal space

(c) Superior phrenic spot

Between sternomastoid heads

(d) Right 12th rib

(e) Right flank

(f) Costal margin

(5) **Thorax basal signs .**

Deficient air entry

(6) **X-Rays :**

Impaired mobility of diaphragm

(B) Stage of subphrenic abscess :

- (1) **Pyrexia :** High and remittent
- (2) Pain pronounced
- (3) Diaphragmatic irritation + +
- (4) **Local tenderness :** More acute
- (5) Local. (a) Swelling
(b) Rigidity
(c) Dullness \times tympanitis
- (6) **Basal :** Effusion or pneumonia
- (7) Blood. leucocytosis $> 20,000$
- (8) **X-Rays :**
 - (a) Immobility
 - (b) Elevation
 - (c) Domeshape

} of diaphragm

- Diff diag**
- (1) **Liver affections :**
 - (a) Amœbic abscess
 - (b) Pylephlebitis with portal pyæmia
 - (c) Congestive enlargement
 - (2) **Basal thoracic affections :**
 - (a) Pleurisy with effusion
 - (b) Empyema
 - (c) Basal pneumonia
 - (3) **Kidney affections**
 - (4) Any other upper abdominal
 - (a) Inflammation
 - (b) Tumour
 - (5) **Superficial sepsis :** Thoracic or abd wall
 - (6) **Fevers :** Typhoid, malaria

- Compl**
- (1) **General :** (a) Toxæmia
(b) Septicæmia
(c) Pyæmia
 - (2) **Basal thorax :** (a) Pleurisy
(b) Empyema
(c) Pneumonia
 - (3) **Perforation :** Into
 - (a) Pleura empyema
 - (b) Peritoneum peritonitis
 - (c) Pericardium pyopericardium

Treat (A) *Preventive*
Prompt & efficient treat of causative lesion

(B) *Conservative*

Ind Subphrenitis

- Tech**
- (a) Removal + drain. of primary lesion
 - (b) Rest + heat : local
 - (c) Chemo therapy
 - (d) Anti serum therapy

(C) *Operative***Exploration → Evacuation → Drainage**(1) *Extraperitoneal route*(a) *Posterior extraperitoneal*

- Ind (α) Right postero-superior
 (β) Right inferior
 (γ) Left postero inferior
 (δ) Retroperitoneal posterior

Position Renal

- Anæsth (α) General
 (β) Paravertebral

- Steps (1) Incision over the last rib
 ↓ (2) Subperiosteal resection last rib
 ↓ (3) Transverse incision
 (a) Across the bed of the rib
 (b) At the level of 1 L vertebra
 (c) Through the diaphragm
 ↓ (4) Peel off the peritoneum
 From the diaphragm
 ↓ (5) Exploration of the abscess
 (a) Finger
 (b) Aspiration needle
 ↓ (6) Evacuation
 ↓ (7) Drainage

(b) *Anterior extraperitoneal*

- Ind (α) Right antero superior
 (β) Left superior
 (γ) Left antero inferior

- Steps (1) Incision
 Below and parallel to costal margin
 ↓ (2) Peel off the peritoneum
 From the diaphragm
 ↓ (3) Exploration of the abscess
 (a) Finger
 (b) Aspiration needle
 ↓ (4) Evacuation
 ↓ (5) Drainage

(2) *Transpleural route*

Ind Complicating empyema

- Steps (a) Aspiration-confirmation of empyema
 ↓ (b) Resection of lower two ribs
 ↓ (c) Evacuation of empyema
 ↓ (d) Dilatation of phrenic perforation
 ↓ (e) Drainage
 (α) Empyema
 (β) Subdiaphragmatic abscess

(3) **PELVIC ABSCESS**

Def Collection of pus in true pelvis

- Etio.** (A) True pelvis pelvic sepsis
: Female genital sepsis • Salpingitis
- (B) False pelvis iliac sepsis
(a) Acute appendicitis
(b) Acute diverticulitis
- (C) General peritoneal cavity . treatment sepsis
(a) Acute diffuse peritonitis
+ (b) Fowler's position
- Clinic.** (1) History of primary septic focus :
(a) Salpingitis
(b) Appendicitis
(c) Any other peritonitis
- (2) Pelvic visceral irritation :
(a) Bladder . tenesmus
(b) Rectum proctitis
- (3) General signs of sepsis :
Temperature +
- (4) Rectal examination .
(a) Tenderness
(b) Bogginess
(c) Mucus
- (5) Blood examination .
Leucocytosis > 20000
- Compl** (1) Perforation Into
(a) Rectum
(b) Bladder
(c) Vagina
(d) Peritoneal cavity
- (2) Spreading general peritonitis
- Treat** (A) Incision + evacuation + drainage
+ (B) Treatment of primary focus : If feasible
- (1) Rectal route :
Ind Rectum adherent to abscess
Steps (a) Stretching of anal sphincter
↓ (b) Aspiration needle
Through adherent spot
↓ (c) Scalpel opening
↓ (d) Dilatation by forceps
↓ (e) Drainage tube
Fixed to rectal wall
- (2) Vaginal route :
Ind Vagina adherent to abscess
Steps . (See above)
- (3) Iliac route :
Ind (a) Extension from iliac fossa
(b) Non adherent to rectum or pelvis

- Danger: (1) Soiling of pelvis
 If there is no infection
 (2) Drainage not free
 (3) Secondary hæmorrhage

(4) **Suprapubic route:**

- Ind: (1) Residual abscess
 (2) Desperate diffuse peritonitis.
 (See under Acute Peritonitis)

(C) CHRONIC PERITONITIS.

Path. types: (1) *Chronic or sub acute pyogenic peritonitis*

Etio: Gunshot wounds

Clinic: (a) Chronic general toxæmia

 (b) Inflammatory swellings in abdomen

(2) *Chronic gonococcal peritonitis*

Etio: Gonococcal salpingitis

Clinic. Adhesive pelvic peritonitis

Compl. Intestinal obstruction

(3) *Chronic pneumococcal peritonitis*

(a) Ascitic

(b) Encysted

(c) Adhesive

(4) *Chronic tuberculous peritonitis*

Etio: Age: (a) Acute and subacute in children

 (b) Chronic in adults

Predispos. Raw cow's milk

Bact: Bovine tubercle bacillus

Path: Source of infection.

(a) Hæmatogenous phthisis

(b) Ingestion tuberculous sputum

(c) Abdominal foci

 (a) Mesenteric lymph glands

 (β) Intestines, appendix, ileum, cæcum

 (γ) Pyosalpinx

Clinical types: (A) *Ascitic: wet type*

Clinic: (a) Children

 (b) Insidious ascites

 (c) T B Toxæmia

Treat: (1) **Exploratory laparotomy**

 ↓ (2) Evacuation of fluid

 ↓ (3) Oxygenation of peritoneum

 ↓ (4) Closure without drainage

(B) *Adhesive or plastic dry type*

Clinic: (a) **Doughy abdomen:**

 (a) Swollen

 (β) Slightly tender

 (γ) Diffusely resistant

- (b) Sausage-shaped omentum
- (c) Matted intestines
- (d) General tuberculous toxæmia :
 - (a) High swinging temp.
 - (β) Sweating
 - (γ) Loss of flesh
- Diff. diag (a) Malignant abdomen
- (b) Intussusception
- (c) Chronic gastro jejunal perforation
- Compl : (1) Intestinal obstruction
- (2) Peritoneal abscesses
- (3) Fæcal fistulæ
- Treat. Conservative
 - (C) *Ulcerative* : fistulous type
 - Path : (1) Intestinal ulceration
 - ↓ (2) Intestinal perforation
 - ↓ (3) Local peritoneal abscess
 - ↓ (4) Fæcal fistula .
 - (a) Internal
 - (a) Visceral
 - (β) Peritoneal
 - (b) External
 - (D) *Encysted* purulent type
 - Etio Tabes mesenterica
 - Path { (i) Caseation
 - ↓ (b) Rupture
 - ↓ (c) Local tuberculous abscesses
 - ↓ (d) Local cysts
- Diff diag . Ovarian or mesenteric cysts
- (E) *Chronic miliary*
- Diagnosis (1) Local condition
- (2) General tuberculous toxæmia
- Compl (1) Intestinal obstruction :
 - (a) Chronic
 - (b) Acute on chronic
- (2) Fæcal fistula :
 - (a) Insidious
 - (b) Post operative
- (3) Acute peritonitis or perit. abscess
- (4) Tuberculous toxæmia
- Treat. Conservative anti-tuberculous :
 - Except (a) Ascitic peritonitis
 - (b) Local focus :
 - (α) Drainage of an abscess
 - (β) Short circuit
 - (γ) Excision
 - (c) Intestinal obstruction
 - (d) Doubtful diagnosis

- (5) *Chronic septic peritonitis* residual
Incompletely resolved acute diffuse perit.
- (6) *Encapsulating chronic peritonitis*
Def Development of thick contractile membrane, enveloping intestines and mesentery
Etio Unknown, ? T B
Clinic (A) Obstructive type
Intestinal obstruction
(B) Carcinomatous type
Tumour
- Diagnosis **'Resonant ovarian cyst'**
Treat (a) Decapsulation
(b) Short circuit
- (7) *Chronic post operative peritonitis*
Etio (a) Residue of acute post operative perit
(b) **Nature of infection**
(a) Tuberculosis
(β) Actinomycosis
(c) **Intractable focus**
(a) Faecal fistula
(β) Carcinoma
(d) **Foreign body left in**
(a) Abdominal mops
(β) Drainage tubes
- Clinic (a) Unhealing sinus or fistula
(b) Adhesion with int obstruction
- Compl (1) Intestinal obstruction
(a) Adhesions
(b) Matting
(2) Unhealing sinus or fistula
(3) Toxaemia
- Treat Treat the etiology

Clinical types of chronic peritonitis

- (1) *Chronic adhesive peritonitis*
Syn (a) Hyperplastic peritonitis
(b) Sclerosing peritonitis
Etio Chronic or recurrent inflammation
(a) Repeated operations
(b) Specific (a) T B
(β) Syphilis
- Path Fibrosis → (a) Contractions
(b) Adhesions
(1) Bands
(2) Links
(3) Compression
(4) Displacements

- (5) Distortions
- (6) Volvulus
- (7) Membranes
- (8) Thickenings
- Clinic: (a) Chronic intestinal obstruction
- (b) Palpable swellings
- Treat: (A) Local:
 - (a) Short circuit
 - (b) Excision
- (B) General: conservative
- (2) *Chronic serous peritonitis*:
 Etio: Tuberculosis
- Clinic (a) Insidiously increasing fluid in abdomen
- (b) General wasting
- Diff diag (1) T. B.
- (2) Carcinomatosis
- (3) Ascites
- (4) Ovarian or mesenteric cyst
- Treat (a) Paracentesis
- (b) Exploration → evacuation → closure

(IV) TUBERCULOUS ABDOMEN:

- Etio (a) Children and adolescents
- (b) Mahomedan females
- Path (a) Ingestion of raw cow's milk Bovine
- (b) Ingestion of tuberculous sputum
- Secondary to phthisis
- Types: (A) Tuberculous enteritis: (See under Intestines)
- Path (1) Small intestines: Ulcerative
 - (a) Multiple transverse ulcers
 - ↓ (b) Multiple stenosis
- (2) Cæcum: Hyperplastic
 - (a) Cæcal hyperplasia
 - ↓ (b) Intestinal obstruction
- (3) Colon: Ulcerative
- Clinic (1) Intestinal colic
- (2) Diarrhœa
- (3) Tumid, resistant, tender abdomen
- (4) Tuberculous toxæmia
- Clinical types (a) Ulceration: Diarrhœa
- (b) Stenosis: Intestinal obstruction
- (c) Hyperplasia: Intestinal obstruction
- (d) Fistula: Fæcal fistula
- (B) *Tabes mesenterica*:
 Etio: Commonest form
- Path: (a) Ingestion of raw infected milk
- ↓ (b) Intestines
- ↓ (c) Mesenteric glands

Clinic types	(1)	Latent general tuberculous toxæmia
	(2)	Palpable mesenteric glands
	(3)	Chronic dyspepsia
	(4)	Abdominal colic → intestinal obstruction
	(5)	Tuberculous peritonitis
	(6)	Caseated gland
	(a)	Local abscess
Diff diag	(b)	Mesenteric pseudocyst
	(7)	Radiographic shadows
	(a)	Appendicitis
	(b)	Tuberculous intestines
	(c)	Carcinoma
Compl	(d)	Cyst
	(e)	Stone shadows
	(1)	T B Peritonitis
Treat	(2)	Intestinal obstruction
	(1)	Conservative Anti tuberculous
Ind	(2)	Operative
		Appearance of complication
	(a)	T B peritonitis
	(b)	Intestinal obstruction
	(c)	Abscess or cyst formation
Clinic	(C)	T. B peritonitis (See above)
	(1)	Acute miliary tubercular peritonitis
	(2)	Chronic tuberculous peritonitis
	(a)	Chronic miliary
	(b)	Ascitic
	(c)	Adhesive or plastic
	(d)	Ulcerative or fistulous
Examin	(e)	Encysted or purulent
	(1)	Stools T B
	(2)	X Rays calcareous glands
	(3)	Tuberculin test of value within first 3 years
	(a)	Positive (α) Disease present
		(β) Disease past
	(b)	Negative (α) Disease absent
		(β) Disease acute
		(1) Acute miliary
		(2) Acute exacerbation
Diff	(a)	Chronic dyspepsia
	(b)	Chronic enteritis or colitis
	(c)	Acute or chronic intestinal obstructions
	(d)	Acute or chronic peritonitis
	(e)	Causes of ascites
	(f)	Causes of abdominal tumour
	(g)	Causes of faecal fistulae
Compl	(a)	Acute peritonitis
	(b)	Chronic adhesive peritonitis

- (c) Strictures
- (d) Adhesions
- (e) Fistulæ
- (f) Mass formations
- (g) Intestinal obstruction
- (h) General TB toxæmia

Treat **Conservative** Except

- (A) Ascitic type
Exploration → evacuation → closure
- (B) Local type
 - (a) Short circuit
 - (b) Excision
- (C) Complicated type
 - (a) Intestinal obstruction
 - (b) Abscess formation

- Compl
- (1) Fæcal fistula
 - (2) Persistent sinus
 - (3) Adhesions

(V) NEOPLASMS OF THE PERITONEUM.

(1) DIFFUSE CARCINOMATOSIS

Etio (a) Any intra abdominal carcinoma

- (a) Stomach
- (β) Cæcum
- (γ) Sigmoid
- (δ) Rectum

(b) Carcinoma breast

Clinic (1) **Multiple, hard, small, warty growths**

All over the peritoneum

- (a) Greater omentum
- (b) Ovaries Krukenberg's tumours
- (c) Douglas pouch

(2) **Hæmorrhagic fluid**

- Diff diag
- | | | |
|--------------------------|---|-------------------|
| (1) Miliary tuberculosis | } | growths |
| (2) Fat necrosis | | |
| (3) Carcinomatosis | | |
| (1) Acute pancreatitis | } | hæmorrhagic fluid |
| (2) Acute strangulation | | |
| (3) Carcinomatosis | | |

(3) PSEUDOMYXOMA PERITONEI

Etio (1) Mucoid ovarian cystadenoma

(2) Mucocele of the appendix

(3) Mucoid carcinoma

Clinic Localised or diffuse myxomatous deposits

- Compl
- (a) Recurrence
 - (f) Local malignancy

- Treat: (1) Removal of primary focus
 (2) Thorough peritoneal toilet
 (3) Deep X-Rays

(VI) ASCITES:

Def: Collection of serous fluid in the peritoneal cavity

Clinic: (1) Inspection:

- (a) Uniform distension of the abdomen .
 - (α) With bulging of the flanks
 - (β) With bulging of dependant part
- (b) Flat or protruding umbilicus
- (c) Shiny, tense skin .
 - : With visible veins
- (d) Pressure effects :
 - (α) Displaced heart
 - (β) Oedematous lower limbs
- (2) Palpation
 - (a) Thrill
 - (b) Dipping
- (3) Percussion
 - (a) Dullness in flanks when supine
 - (b) Horse shoe dullness
 - (c) Shifting dullness on change of posture
- (4) Mensuration
 - Umbilicus (a) Nearer pubes
 - (b) Equidistant from ant. sup. spine
- (5) Paracentesis

Diff. diag: (1) **Tympanitis:**

- (a) Resonance
- (b) No thrill
- (c) Visible coils
- (2) **Ovarian cyst:**
 - (a) Origin from pelvis
 - (b) Umbilicus : (α) Nearer ensiform
 - (β) To one side
 - (c) Dullness : (α) Present in front
 - (β) Absent in flanks
 - (γ) Convex upper border
 - (d) Vaginal exam uterus displaced
 - (e) Blaxland : flat ruler test
 - Aortic pulsation transmitted
- (3) **Gravid uterus with hydrops amnii:**
 - (a) Signs of pregnancy
 - (b) Dullness in front, resonant flanks
 - (c) Varying consistency of the uterus
 - On contraction and relaxation
- (4) **Distended bladder:**
 - (a) Incontinence with overflow
 - (b) Suprapubic tumour

- (c) Dullness in front ; resonant flanks
- (d) Passage of a catheter

(5) **Large abdominal cysts :**

- (a) Hydronephrosis
- (β) Pancreatic cyst
- (γ) Mesenteric cyst
- (δ) Retroperitoneal cyst

- Diag : (a) Enlargement not uniform
- (b) Examination of the fluid

(6) **General obesity :**

- (a) Deep umbilicus
- (b) General obesity

(7) **Phantom tumour :**

- (a) Anæsthesia
- (b) Age. (a) Hysterical adolescents
- (β) Climacteric

Causes : (A) Diseases of the peritoneum :

- (1) Non suppurative acute peritonitis
- (2) Simple chronic peritonitis
- (3) Tuberculous peritonitis
- (4) Malignant peritonitis
- (5) Polyserositis

(B) **Systemic back pressure :**

- (1) **Chronic heart failure :**
 - (a) Valvular disease
 - (b) Chronic myocardial affections
 - (c) Adherent pericardium
- (2) Heart failure secondary to chronic lung
- (3) Heart failure . due to hyperpiesia

(C) **Portal back pressure :**

- (a) **Portal vein :**
 - (1) Non-suppurative portal thrombosis
 - (2) Enlarged portal lymph glands
 - (3) Pressure of tumours .
 - . Of surrounding organs
- (β) **Liver affection ✱**
: **Cirrhosis liver**

(D) **Inferior vena cava obstruction :**

- (1) Thrombosis
- (2) Chronic mediastinitis
- (3) Mediastinal new growth

(E) **Kidney diseases :**

- (1) Dropsy (nephritis and nephrosis)
- (2) Secondary to kidney heart
- (3) Kidney peritonitis

(F) **Splenic diseases :**

- (1) Splenic anæmia

- (2) Banti
- (3) Leukæmias

(G) **Lymphatic obstruction** : Chylous ascites

- (1) Severe trauma to abdomen or chest
- (2) Elephantiasis
- (3) Retroperitoneal or mediastinal sarcoma

Treatment : (A) **Paracentesis abdominis** :

- Prep** : (a) Empty the bladder
 (b) Half-sitting position
 (c) Abdominal binder

Site : Midline, midway between umbilicus & pubes

Instrument : Trocar and cannula

Direction : Backwards and slightly downwards

Post : Stimulant dose

- Compl** : (a) Shock
 (b) Visceral trauma
 (c) Adhesive peritonitis

- { (B) **Talma-Morison omentopexy** : (See under Liver)
- { (C) Paterson glass bobbin
- { (D) Wynter's femoral drainage.

Ind : Chronic alcoholic cirrhosis of the liver
 · Which has withstood many tappings

(II) THE GREAT OMENTUM

(1) LOCAL ACUTE OR CHRONIC PERITONITIS :

- : **Adhesion** of the omentum around the focus
 (Policeman of the abdomen)
- : (Absent in virulent forms of peritonitis)

(2) TUBERCULOSIS ·

(A) **Miliary tuberculosis** :

- Diff. diag** : (a) Carcinomatosis
 (b) Fat necrosis

(B) **Sausage mass** :

Clinic : Transverse supra umbilical

- Diff. diag** : (a) Carcinoma stomach or colon
 (b) Chronic gastro-jejunal perforation
 (c) Intussusception
 (d) Tabes mesenterica

(3) SECONDARY CARCINOMA

Etio : Any intra abdominal carcinoma

- Clinic** (a) Ascites with blood stained fluid
 (b) Secondary firm, multiple nodules

(4) SARCOMA .

- (a) Painful tumour
- (b) Blood-stained ascites
- (c) Cachexia

(5) FAT NECROSIS

- Etio Acute pancreatitis
 Path (See under Pancreas)
 Clinic (a) Opaque yellow, varying sized, scattered
 (b) Blood stained fluid
 (c) Acute pancreatitis
 Diff diag (1) Miliary tuberculosis
 (2) Carcinomatosis

(6) TORSION One of the causes of acute abdomen

- Etio Bulky omentum with abnormal attachment
 Sites (a) Hernial sac
 (b) General peritoneal cavity
 Clinic Acute abdomen
 Diff diag (a) Strangulated hernia
 (b) Acute appendicitis

(7) OMENTOCELE

Omentum in a hernial sac

(8) OPERATIONS ON OMENTUM**(A) Excision**

- Ind (a) Prolapse
 (b) Omentocele
 (c) Adhesions
 (d) Local focus
 (e) Along with gastrectomy
 Tech (1) Always transect before ligature
 (2) Use silk
 (3) Always look for bleeding from the stump
 Before returning into abdomen
 (4) Do not tie too loose or too tight ligatures
 (5) Bury the raw stump

(B) Omentopexy (See under Liver)**(C) Free omental graft**

- Used as a cover over any intestinal suture
 (a) Closure of perforations
 (b) Intestinal anastomosis
 (c) Covering raw areas

(D) Intestinal and peritoneal drainage tube
Bring out through the omentum**(III) MESENTERY****(1) TRAUMA****(1) CONTUSION OR HÆMATOMA**

- Etio (1) Closed trauma
 Run over impacts blows

- (2) Stab or gunshot wounds :
: With injury to vessels

Path . Collection of blood between the two leaves

Clinic : (1) History of trauma

↓ (2) Paralytic ileus

Compl : (1) Paralytic ileus

(2) Gangrene intestines

* Treat : (1) Conservo observative

↓ (2) Operative

Ind : Gangrene intestines

(2) WOUNDS AND LACERATIONS .

Etio . (1) Run overs

(2) Stab or gunshot wounds

Path : (a) Longitudinal tears

(b) Transverse tears

: With injury to vessels

Compl : (1) Hæmatoma mesentery

(2) Hæmo peritoneum

(3) Gangrene intestines . transverse tears

(4) Associated trauma to other viscera

Treat . (A) Immediate exploration

↓ (B) Longitudinal suture

or (C) Resection intestines

Ind Transverse tear

(II) CIRCULATORY BLOCK :

(1) MESENTERIC VESSEL THROMBOSIS .

(See page 1214)

Etio Past middle life

Causes (1) Heart disease . endocarditis

(2) Splenectomy . for splenic anæmia

(3) Arteriosclerosis

Path : (a) Endocarditis

↓ (b) **Mesenteric embolism**

↓ (c) Œdema and congestion . if venous

or (c) Ischæmia if arterial

↓ (d) **Gangrene intestines**

Clinic : (1) Sudden severe abdominal pain

(2) **Hæmatemesis + blood in stools**

(3) Hæmorrhagic peritoneal fluid

(4) **Acute intestinal paralysis syndrome**

(5) Absence of tenderness and rigidity

(6) **Some vascular focus**

Treat : Early exploration → intestinal resection

(2) TORSION OF THE MESENTERY

Etio : (a) Length +

(b) Inflammatory adhesions

(c) Bulky and heavy adhesions

Exciting: Laborious work

Sites: (1) Small intestines mesentery
(2) Sigmoid mesentery

Path: (1) Vascular and nervous obstruction
↓ (2) Congestion
↓ (3) Thrombosis
↓ (4) Ischaemia
↓ (5) Gangrene intestines

Clinic: Intestinal volvulus syndrome

Treat: (See under Volvulus)

(III) MESENTERIC GLANDS:

(1) SEPTIC LYMPHADENITIS.

Etio. Tonsillitis

Site: Ileo caecal angle

Bact: Pyococci

Clinic: (a) Children

(b) Acute inflammatory abdomen

Diff. diag: Acute appendicitis

Compl: (a) Recurrence

(b) Abscess

(c) Peritonitis

(d) Intestinal obstruction

Treat: (A) Conservative.

(a) Rest: Ochsner-Sherren

(b) Sulphonamides

(B) Operative

Ind: Complications

Tech. (a) Drainage of the abscess

(b) Drainage of the peritoneum

(2) TABES MESENTERICA:

: (See under Tuberculous Abdomen)

(3) LYMPHADENOMATOUS GLANDS.

(a) Palpable abdominal glands

(b) Pressure syndrome

(a) Jaundice

(β) Portal obstruction

(c) Other signs of lymphadenoma.

(a) Enlarged glands all over

(β) Enlarged spleen

(γ) Anæmia, etc.

(4) SECONDARY CARCINOMATOUS GLANDS

(IV) MESENTERIC CYSTS:

Varieties: (1) Traumatic: blood cyst

(2) Tuberculous: chronic glandular abscess

(3) Hydatid

(4) Dermoid

(5) Chylous

(6) Congenital (Personal case)

Clinic New born child with acute intestinal obstruction
Moderate distension of abdomen, below the umbilicus

Operation (a) Big mesenteric cyst
(b) High & rudimentary caecum & appendix
(c) Volvulus with gangrene of $\frac{1}{3}$ rd of ileum

Result Death 3 days after operation
4 days after birth

Clinic Tillaux's triad:

- (a) Fluctuating swelling
- (b) Moves at right angles to mesenteric axis
- (c) Resonance around and across

Compl (1) Intestinal obstruction
(2) Rupture
(3) Haemorrhage
(4) Torsion
(5) Incarceration into pelvis

Treat (1) Marsupialisation
(2) Excision
Mind the viability of intestines

(V) MESENTERIC NEW GROWTHS:

- (1) Benign Lipoma, fibroma
- (2) Malignant Secondary carcinoma

(IV) RETROPERITONEAL SPACE

(1) TRAUMA:

(1) Retroperitoneal hæmorrhage.

Etio Stab wounds back, run overs

Site (1) Perinephric space
(2) Root of the mesentery

Compl (a) Sepsis
(b) Paralytic ileus

(2) Retroperitoneal rupture:

Sites (a) Kidney
(b) Duodenum
(c) Colon
(d) Pancreas

Path Retroperitoneal cellulitis
(a) Pyococcal
(b) Anaerobic

Compl (1) Diffuse gangrene of abdominal wall
(2) Abscesses
(3) Fistulae or sinuses

(II) INFLAMMATION :**(1) RETROPERITONEAL CELLULITIS.****Etio (1) Trauma :**

- (a) Accidental ruptures of
 - (1) Kidneys and ureters
 - (2) Pancreas
 - (3) Duodenum
 - (4) Colon

- (b) Operative trauma in
Sliding hernia

- (2) Posterior duodenal perforations
- (3) Acute pancreatitis
- (4) Perinephric infections
- (5) Retrocæcal appendicitis
- (6) Extravasation of urine
- (7) Parametrial infections

Clinic (a) Primary etiological focus
 (b) Spreading inflammatory phenomena
 (c) Acute general toxæmia

Treat (A) General anti toxic measures
 (B) Treatment of etiological factor
 (C) Free drainage

(2) RETROPERITONEAL ABSCESS**(A) Subphrenic : (See under Subphrenic Abscess)****(1) Retroperitoneal posterior****Syn** Phrenico lumbar

Etio (a) Retrocæcal appendix
 (b) Perinephric abscess
 (c) Diverticulitis
 (d) Pancreatitis

(2) Retroperitoneal anterior .**Syn** Bare area of the liver**Etio** Umbilical sepsis**(B) Perinephric : (See under Kidney)**

Etio (1) Kidney infections
 (2) Retrocæcal appendicitis
 (3) Pyæmic

Treat. Drainage**(C) Lumbar :**

Etio (a) Kidney infections
 (b) Appendicular infections
 (c) Diverticulitis

(D) Iliac :

Etio (1) *Acute* : (a) Acute retrocæcal appendicitis
 (b) Acute diverticulitis

- (c) Urinary extravasation
- (d) **Acute lymphadenitis :**
 - Etio Lower limb infection
 - Age Children
 - Site External iliac
 - Clinic Pseudo appendicitis
 - Diff diag Appendicitis
 - Treat (1) Extra peritoneal incision
 - ↓ (2) Drainage

(2) *Chronic* Psoas abscess

(IV) TUMOURS-

- (1) **Sarcoma :**
 - Etio Commonest
 - Site Perinephric
 - Clinic (1) Immobile, irregular, fixed, rapid tumour
 - (2) Cachexia with irregular temperature
 - Diff diag Any intraperitoneal tumour
- (2) **Neuroblastoma :**
 - Etio Children
 - Clinic Rapid growth
- (3) **Ganglioneuroma :**
 - Clinic Slow growth
- (4) Lipoma, liposarcoma
- (5) Teratoma

(V) IMPORTANT POINTS

- (1) Synopsis of operative treatment of acute peritonitis
 - (A) Desperate condition
 - Blind suprapubic drainage in bed
 - (B) Bad condition
 - (a) Blind caecostomy or enterostomy
 - + (b) Suprapubic drainage
 - (C) Fair condition
 - (a) Primary focus diagnosed
 - (a) Treat the primary focus
 - (β) Peritoneal toilet
 - (r) Drainage
 - (b) Primary focus uncertain
 - (a) Gridiron appendix exploration
 - ↓ (β) General exploration
- (2) *Primary caecostomy or enterostomy is a life saving measure in advanced cases of general peritonitis.*
- (3) Post-operative peritonitis de novo is commonest after abdomino perineal resection of rectum.

(II) INFLAMMATION :**(1) RETROPERITONEAL CELLULITIS****Etio (1) Trauma :**

- (a) Accidental ruptures of
 - (1) Kidneys and ureters
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 - (4) Colon

- (b) Operative trauma in
Sliding hernia

- (2) **Posterior duodenal perforations**
- (3) **Acute pancreatitis**
- (4) **Perinephric infections**
- (5) **Retrocæcal appendicitis**
- (6) **Extravasation of urine**
- (7) **Parametrial infections**

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 (b) Spreading inflammatory phenomena
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 (B) Treatment of etiological factor
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Etio (a) **Retrocæcal appendix**
 (b) **Perinephric abscess**
 (c) **Diverticulitis**
 (d) **Pancreatitis**

(2) Retroperitoneal anterior**Syn** Bare area of the liver**Etio** Umbilical sepsis**(B) Perinephric (See under Kidney)**

Etio (1) **Kidney infections**
 (2) **Retrocæcal appendicitis**
 (3) **Pyæmic**

Treat Drainage**(C) Lumbar :**

Etio (a) **Kidney infections**
 (b) **Appendicular infections**
 (c) **Diverticulitis**

(D) Iliac :

Etio (1) **Acute.** (a) **Acute retrocæcal appendicitis**
 (b) **Acute diverticulitis**

- (c) Urinary extravasation
 (d) **Acute lymphadenitis:**

Etio: Lower limb infection

Age: Children

Site: External iliac

Clinic: Pseudo appendicitis

Diff diag: Appendicitis

Treat: (1) Extra peritoneal incision

↓ (2) Drainage

(2) *Chronic*: Psoas abscess

(IV) TUMOURS:

(1) **Sarcoma:**

Etio: Commonest

Site: Perinephric

Clinic: (1) Immobile, irregular, fixed, rapid tumour

(2) Cachexia with irregular temperature

Diff diag: Any intraperitoneal tumour

(2) **Neuroblastoma:**

Etio: Children

Clinic: Rapid growth

(3) **Ganglioneuroma:**

Clinic: Slow growth

(4) Lipoma, liposarcoma

(5) Teratoma

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(γ) Drainage

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(2) *Primary caecostomy or enterostomy is a life saving measure in advanced cases of general peritonitis.*

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Syn Phrenico lumbar

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 (b) **Perinephric abscess**
 (c) **Diverticulitis**
 (d) **Pancreatitis**

(2) *Retroperitoneal anterior*

Syn Bare area of the liver

Etio Umbilical sepsis

(B) Perinephric : (See under Kidney)

Etio (1) Kidney infections
 (2) Retrocæcal appendicitis
 (3) Pyæmic

Treat Drainage

(C) Lumbar :

Etio (a) Kidney infections
 (b) Appendicular infections
 (c) Diverticulitis

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 - (a) Gridiron appendix exploration
 - ↓ (β) General exploration
- (2) *Primary caecostomy or enterostomy is a life saving measure in advanced cases of general peritonitis*
- (3) Post operative peritonitis de novo is commonest after abdomino perineal resection of rectum.

- (4) *Patients in shock must all be treated conservatively for a few hours unless there is a definite evidence of.*
 - (a) *Intraperitoneal hæmorrhage*
 - (b) *Perforation of a hollow viscus*
- (5) *Most common causes of acute spreading peritonitis*
 - (a) *Acute appendicitis*
 - (b) *Gastroduodenal perforations*
 - (c) *Intestinal obstructions*
 - (d) *Pelvic inflammations*
 - (e) *Typhoid perforations*
 - (f) *Peritoneal trauma*
- (6) *Differential diagnosis between*
 - (a) *Miliary tuberculosis*
 - (b) *Fat necrosis*
 - (c) *Carcinomatosis*
- (7) *The real difficulty in the way of conservatism in the treatment of pneumococcal peritonitis is doubtful diagnosis, if diagnosis of pneumococcal peritonitis is established beyond doubt, conservatism for at least 10 days is preferable to immediate operation*
- (8) *Causes of leakage from intestinal stump or anastomosis*
 - (a) *Distension*
 - (a) *Gas*
 - (β) *Bulky enemæ*
 - (b) *Poor blood supply*
 - (c) *Incomplete peritoneal covering*
 - (d) *Bursting of the stump due to*
 - (α) *Peristalsis*
 - (β) *Distension*
- (9) *A localised peritoneal abscess must be opened extra peritoneally whenever possible.*
- (10) *Rise in pulse associated simultaneously with fall in temperature is an ominous sign in acute peritonitis*
- (11) *A correct pre operative diagnosis and a good anæsthesia are more than half the battle in the operative treatment of acute peritonitis*
- (12) *Essential points in surgery of acute peritonitis*
 - (a) *Pre operative preparation*
 - (α) *Antishock*
 - (β) *Antitoxic*
 - (γ) *Alimentary drainage*
 - (1) *Gastroduodenal suction*
 - (2) *Glycerine enemata*
 - (b) *Efficient anæsthesia*
 - (α) *No cyanosis*
 - (β) *No rigidity*
 - (c) *Rapid, delicate and minimum handling*

- (d) *No evisceration*
- (e) *No unnecessary drains*
- (f) *Rational post operative treatment*
 - (a) *As in pre operative period*
 - (β) *Anatomical and physiological rest*
- (13) *Peritonitic toxæmia and paralytic ileus are the most common acute complications of peritonitis*
- (14) *Laparotomy is the best method of dealing with the reduced mobility of the peritoneum in the reduced mobility of the peritoneum. Adminis-
is good in
diffuse peritonitis*
- (15) *The most common diseases to be differentially diagnosed from primary pneumococcal or streptococcal diffuse peritonitis are*
 - (a) *Appendicular peritonitis*
 - (b) *Salpingitis*
 - (c) *Paralytic ileus*
- (16) *Patient must be in high Fowler's position if a suprapubic tube has to drain. See that every drainage tube is in the most dependant position by appropriate posture*
- (17) *Never delay spinal anæsthesia (as a treatment) later than the end of second day in a case of paralytic ileus*
- (18) *Leucocytosis of 30 000 or more with 90% polymorphs in a female child under 10 with acute peritonitis
Pneumococcal peritonitis*
- (19) *Post operative internal faecal fistula should be suspected when the patient suddenly develops signs of general peritonitis about the fourth day after appendicectomy especially after an unwise administration of a large enema*
- (20) *Treatment of post operative internal faecal fistula*
 - (A) *Prophylactic*
 - (a) *Cæcostomy*
 - (b) *Avoidance of early large enema*
 - (B) *Curative*
Immediate external drainage.
- (21) *Exploration by a needle in a case of intraperitoneal abscess is dangerous*
- (22) *In general peritonitis if a patient is rigid and straining under anæsthesia his chances of survival are nearly halved*
- (23) *90% of subphrenic abscesses follow infective abdominal lesions, most commonly*
 - (a) *Acute appendicitis*
 - (b) *Gastro duodenal perforations*
 - (c) *Hepato biliary infections.*
- (24) *Pus somewhere pus nowhere, pus under the diaphragm*

- (25) Needling is dangerous and unnecessary in sub diaphragmatic abscess.
- (26) Sub diaphragmatic abscess :
- (a) Latent :
: Pus somewhere, pus nowhere, pus under diaphragm
 - (b) Suggestive :
 - (1) History of abdominal sepsis or operation
 - (2) General signs .
 - (a) Sthenic toxæmia . fever
 - (β) Asthenic toxæmia . wasting
 - (3) Local signs :
: Upper abdominitis
 - (4) Chest signs :
: Basal thoracic signs
 - (5) Special signs
 - (a) X-Rays . fixation and elevation of diaphragm
 - (β) Leucocytosis
- (27) *Fixation and elevation of half of the diaphragm is a definite evidence of subphrenic abscess or phrenic avulsion*
- (28) *In post operative period of any abdominal sepsis, portal pyæmia and subphrenic abscess are great dangers and simulate each other closely.*
- (29) Transpleural and transperitoneal routes for evacuation of subphrenic abscess are unsound and dangerous ; *the best approach is extra peritoneal after the resection of 12th rib*
- (30) Premature drainage of a pelvic abscess through the rectum or vagina—while rectal or vaginal wall can be moved over the abscess—entails risk of pelvic peritonitis or cellulitis.
- (31) Rectal or vaginal drainage of pelvic abscess is contraindicated in
- (a) Doubtful diagnosis
 - (b) Unilateral abscess
 - (c) Rectal or vaginal wall movable over the abscess.
- (32) Some points in the drainage of pelvic abscess :
- (a) Operate when
 - (α) Abscess is median
 - (β) Rectum or vagina is adherent to the abscess
 - (b) ————— of a catheter
 - (c) —————
 - (d) —————
- (33) *Never tap a tuberculous ascites for fear of perforation.*
- (34) *Abdominal tuberculosis .*
- (A) Enteritis :
 - (a) Multiple ulcerative
 - (b) Hypertrophic
 - (c) Adhesive

- (B) *Tabes mesenterica*
 - (a) Latent
 - (b) Palpable glands
 - (c) Alimentary syndrome
Pain colic, dyspepsia
 - (d) Mesenteric pseudocyst
 - (e) Radiographic shadows
- (C) *Peritonitis*
 - (a) Acute milirary
 - (b) Ascitic
 - (c) Adhesive or plastic
 - (d) Encysted
 - (e) Complicated
 - Secondary to (a) Intestinal focus
 - (β) Lymph glandular focus
 - (γ) Generative organ focus
- (35) Common complications of tuberculous abdomen
 - (a) Acute peritonitis
 - (b) Acute intestinal obstruction
 - (c) Faecal fistula or unhealing sinus
 - (d) Tuberculous septicæmia.
- (36) Congenital bilateral hydrocele in a child suspect tuberculous abdomen
- (37) *Indications for surgery in tuberculous abdomen*
 - (a) Ascites laparotomy and evacuation
 - (b) Local variety (a) Short circuit
(β) Excision
 - (c) Complications treatment of
 - (a) Obstruction
 - (β) Acute peritonitis or abscess
- (38) *Acute diffuse peritonitis*
 - (A) Secondary
 - (a) Appendicitis
 - (b) Gastroduodenal perforations
 - (c) Acute intestinal obstructions
 - (B) Post operative
 - (a) Continuation of pre operative
 - (b) Internal leakage
 - (a) Abscess pus
 - (β) Alimentary contents
 - (C) Primary
 - (a) Pneumococcal
 - (b) Streptococcal
- (39) Ascites arising insidiously in a child is almost always due to tuberculosis
- (40) Tuberculosis of intestines
 - (a) Ulcerative
 - ↓ (b) Stricture

- (c) Hypertrophic local
 - (d) Fistulous
 - (e) Adhesive
 - (f) Miliary
- (41) Pouring 80-100 c.c.s of ether or 100 c.c.s of 70% alcohol into peritoneal cavity at operation acts by destroying bacteria. Use drainage, no Trendelenburg position
- (42) Caseous mesenteric gland is a potentially serious condition and may burst at any time giving rise to tuberculous peritonitis
- (43) Acute tuberculous peritonitis
- (1) Miliary
 - (2) Obstructive
 - (3) Perforative
 - (a) Intestinal focus
 - (b) Glandular focus
 - (c) Pyosalpinx
- (44) Freely mobile rounded non tender cyst in abdomen
- (a) ? Ovarian cyst
 - (b) ? Mesenteric cyst
- (45) *Explore every stab wound of the abdomen*
- (46) *Most common causes of hæmoperitoneum*
- (a) Rupture spleen
 - (b) Ectopic gestation
- (47) *Most common intraperitoneal perforations*
- (a) Appendicular
 - (b) Gastroduodenal
 - (c) Typhoid
- (48) *Most common abdominal obstructions*
- (a) External strangulated hernia
 - (b) Volvulus small intestines
- (49) Diminution of liver dullness
- (a) Perforative peritonitis
 - (b) Distended colon
 - (c) Atrophic cirrhosis.
- (50) *Upper peritonitis after any abdominal sepsis*
- (a) ? Pylephlebitis with portal pyæmia
 - (b) ? Subphrenic abscess.
- (60) *Common complications of peritonitis*
- (a) Paralytic ileus and toxæmia
 - (b) Pelvic abscess
 - (c) Basal complications
 - (d) Parotitis
- (61) Ochsner-Sherren treatment
- (a) Localising sepsis
 - (b) Acute generalised sepsis
 - (c) Competent observation.

- (62) Lower abdominitis in children :
 (a) Appendicitis
 (b) Pneumococcal peritonitis
 (c) Iliac lymphadenitis.
- (63) Stages of acute peritonitis :
 (a) Peritonism
 ↓ (b) Period of illusion
 ↓ (c) Peritonitis
 ↓ (d) Paralytic ileus + toxæmia → death
 or (d) Localisation → abscess or fibrosis.
- (64) *Perforative peritonitis* :
 (a) *Board-like rigidity*
 (b) *Obliterated liver dullness*
 (c) *Escape of gas on peritoneal incision.*
- (65) Sites for secondary carcinoma
 (a) Liver
 (b) Omentum
 (c) Ovaries
 (d) Pouch of Douglas.
- (66) Adhesions to greater omentum :
 : Past or present inflammation
- (67) In all X Ray shadows in abdominal area, take the plates in two planes Differential diagnosis between .
 (A) Stones (a) Kidney and ureter
 (b) Gall bladder
 (B) Calcified glands (a) Mesenteric
 (b) Iliac
- (68) Omentopexy for ascites does not give good results; patients die of hepatic inefficiency after about a week.
- (69) Rectal and bladder tenesmus in Fowler's position :
 : ? Pelvic abscess.
- (70) Thin bloodstained fluid in peritoneum
 (a) Streptococcal peritonitis
 (b) Strangulated intestines
 (c) Mesenteric thrombosis
 (d) Acute pancreatitis
 (e) Carcinomatosis peritonæi
 (f) Miliary tuberculosis of the peritoneum.
- (71) Visceral peritoneum is insensitive to any form of stimulation; parietal peritoneum, especially mesentery, is very sensitive to trauma which produces shock.
- (72) B. Coli is the most common causal organism in peritonitis of alimentary origin
- (73) Streptococcus is found in half the cases of primary peritonitis.
- (74) Remember gonococcus in every case of pelvic peritonitis in females.

- (75) Secondary septic peritonitis types
 - (a) Sudden and diffuse perforations and ruptures
 - (b) Gradual and extending extension from a local focus
- (76) *Peritonism* sudden diffuse peritoneal irritation
 - (a) *Agonising pain*
 - (b) *Severe shock*
 - (c) *Initial unrepeated vomit*
- (77) In gradual non perforative septic peritonitis symptoms and signs of causative lesion slowly spread into those of general peritonitis
- (78) *Predagnostic morphia and purgative at any time are the deadliest things in acute abdomen*
- (79) Acute peritonitis syndrome
 - (1) Continuous abdominal pain
 - (2) Recurrent small vomits
 - (3) Rising pulse
 - (4) Rigidity
 - (5) Tenderness
 - (a) Ordinary
 - (b) Rebound
 - (c) Referred
 - (6) Free fluid in peritoneum
 - (7) Dead silence on auscultation
- (80) Conservative treatment of diffuse peritonitis
 - (a) Fowler's position
 - (b) Venoclysis except in
 - (a) Hæmoperitoneum
 - (β) Lung complications
 - (γ) Heart complications
 - (c) Intramuscular antigangrene serum
 - (d) Camphor in oil in x two hourly
 - (e) Gastric aspiration
 - (f) Sulphonamides
- (81) Surgical treatment of diffuse peritonitis
 - (a) Removal of source of infection
 - (b) Peritoneal toilet
 - (c) Drainage of
 - (a) Primary focus
 - (β) Peritoneal pools
 - (d) Cæcostomy or enterostomy
 - (e) Post operative treatment
 - (a) Paralytic ileus
 - (β) Peritoneal toxæmia.
- (82) Desperate cases of diffuse peritonitis
 - Blind suprapubic drainage in bed
 - (a) Catheterise
 - ↓ (b) Small suprapubic incision
 - ↓ (c) Break through the peritoneum by finger
 - ↓ (d) Push in drainage tube.

- (83) Every case of diffuse perit must be operated upon except
- Gonococcal peritonitis
 - Post operative septic peritonitis
 - Primary diffuse peritonitis in children
 - Moribund patients
- (84) *Spinal anaesthesia is best in peritonitis except when circulation is failing when local novocain with sodium cyanide may be used*
- (85) *Golden rules in diffuse peritonitis*
- Do no more than absolutely necessary
 - Do it as gently and as rapidly as possible
- (86) *Be careful not to receive a needle prick in every case of peritonitis, if received, squeeze out three drops of blood immediately*
- (87) Drainage in diffuse peritonitis
- Local focus
3-5 days and then gradual shortening
 - General peritoneal cavity
24-48 hours only, unless draining
 - Draining intestines
About 6 days till it comes out naturally
 - Draining any discharge
Till discharge becomes scanty
- (88) *Acute appendicitis is the most common cause of both localised and diffuse peritonitis*
- (89) Not all cases of subphrenic infection proceed to abscess formation
- (90) Frequency of sites in subphrenic abscess
- Right postero superior intraperitoneal
 - Left antero inferior intraperitoneal
 - Retroperitoneal
- (91) Blood transfusion is very good in pneumococcal peritonitis just at the onset of toxæmia
- (92) Internal faecal fistula should be suspected when the patient suddenly develops signs of diffuse peritonitis about the 4th day after appendicectomy, especially after the administration of an ill advised enema
- (93) *Do not forget ambulatory typhoid in an unexplained acute diffuse perforative peritonitis* in each case, make inquiries about prevalence of typhoid in the area from which the patient comes
- (94) *Main causes of acute peritonitis*
- Primary
 - Pneumococcal
 - Streptococcal
 - Miliary tuberculous

(B) *Secondary*(a) *Perforative*

- (1) Gastric
- (2) Duodenal
- (3) Typhoid
- (4) Appendicular
- (5) Internal faecal fistula

(b) *Septic inflammatory*

- (1) Appendicitis
- (2) Cholecystitis
- (3) Salpingitis gonorrheal
- (4) Post abortional
- (5) Acute pancreatitis
- (6) Mesenteric lymphadenitis

(c) *Obstructive* Intestinal obstruction

- (1) Strangulated hernia
- (2) Volvulus
- (3) Band and adhesions

(d) *Traumatic*

- (1) Ruptures
- (2) Contusions

(e) *Irritative*

- (1) Haemoperitoneum
 - (a) Traumatic
 - (β) Ectopic gestation
- (2) Gastric juice gastric perforation
- (3) Bile
 - (a) Duodenal perforation
 - (β) Biliary passage perforation
- (4) Urine rupture bladder

(95) *In the pre operative and post operative or in conservative treatment of acute abdomen keep one thing in mind Let the septic focus be the most dependant part at all times by appropriate postures On no account allow the healthy part of the peritoneum to be dependant at any time even for a moment*

(96) *In a case of injury it is unwise to delay laparotomy if an intraperitoneal injury is suspected It is better to open and see than to wait and see*

(97) *Avoid cutting out a ligature when tying a pedicle*

(98) *In stab wounds if one wall of a viscus is injured, do not fail to explore the opposite wall*

(99) *Local tenderness is often the key to the site of intra abdominal rupture.*

(100) *In contusions or stab wounds of the intestines, the affected part is many a time discovered just under the affected abdominal wall, due to localised ileus*

- (101) Intestinal ruptures may be multiple, so in every case examine the whole gut
 - (102) *Apply intestinal clamp on either side of a rupture or perforation, before suturing it.*
 - (103) Crib's treatment of acute peritonitis
 - (1) Pre operative gastric lavage + nothing by mouth
 - (2) Local infiltration + sodium evipan
 - (3) Accurate clean cut operation
 - (4) Adequate drainage
 - (5) Fowler's position
 - (6) Continuous rectal drip.
5% saline with 5% glucose
 - (7) Hypodermic saline
2500-3000 c cs every 24 hours
 - (8) Hypodermic morphia.
 - (104) Groups of acute peritonitis signs
 - (A) Acid forming activation
 - (1) Accelerated pulse and respiration
 - (2) Raised blood pressure
 - (3) Pyrexia
 - (4) Loss of strength and weight
 - (B) Protective response to infection
 - (1) Pain + tenderness + rigidity
 - (2) Intestinal distension + vomiting
 - (3) Paralytic ileus.
-

CHAPTER XIV

EXPLORATORY LAPAROTOMY

(I) DEFINITION :

: Surgical incision into the peritoneal cavity through the abdominal parietes

(II) INDICATIONS :

(A) *Urgent or acute abdomen :*

(1) **Congenital abdomen :**

- (a) Imperforate anus
- (b) Exomphalos
- (c) Volvulus neonatorum

(2) **Traumatic abdomen :**

- (a) Hæmoperitoneum
- (b) Closed ruptures and perforations
- (c) Stab and gunshot wounds
- (d) Foreign bodies

(3) **Irritative aseptic peritonitis :**

- (a) Hæmoperitoneum
- (b) Bile peritoneum
- (c) Gastroduodenal extravasations
- (d) Urinary extravasation

(4) **Septic peritonitis :**

- (a) *Primary.*
 - (a) Pneumococcal
 - (b) Streptococcal
 - (c) Acute tuberculous
- (β) *Secordary : to*
 - (a) Acute cholecystitis
 - (b) Acute appendicitis
 - (c) Acute salpingitis
 - (d) Acute pancreatitis
 - (e) Acute mesenteric lymphadenitis

(5) **Perforative peritonitis :**

- (a) Gastroduodenal perforation
- (b) Appendicular perforation
- (c) Typhoid perforation
- (d) Ulcerative perforation

(6) **Obstructive acute abdomen :**

- (a) Strangulated hernia
- (b) Volvulus
- (c) Bands, adhesions, apertures, fossæ
- (d) Intussusception
- (e) Torsions

- (f) Mesenteric thrombosis
- (g) Tuberculous intestine
- (h) Carcinoma

(B) *Non urgent exploration :*

- (a) Doubtful diagnosis
- or (b) Treatment of a diagnosed focus
- + (c) Exploration for :
 - (a) Complications
 - (b) Associated conditions

(III) PRE-OPERATIVE PREPARATIONS:

(A) *Alimentary system :*

(1) *Oral*:

- (a) **Attention to teeth :**
(α) Pyorrhea alveolaris
(β) Carious teeth
(b) **Antiseptic gargles :**
: Condy's, hydrogen peroxide, listerine
(c) **Sialagogues :**
: Lemon to the tongue

(2) **Gastroduodenal:**

(a) **Stomach wash:**

- Ind. (α) Acute: (1) Acute dilatation of stomach
(2) Acute intestinal obstruction
(3) Acute gastritis
(4) Incessant vomiting
(β) Chronic: (1) Chronic pyloric stenosis
+ (2) Gastric stasis

Contraind · Suspected perforation

- Sol: (a) Soda-bi carb solution
(b) Normal saline

(b) **Gastroduodenal drainage:**

- Ind: (a) Alimentary obstructions: high
(β) Gastroduodenal distensions: acute
(γ) Persistent vomiting

Tech. Ryle's duodenal tube:

- (a) Intermittent aspirations
- (b) Continuous suction drain

(c) **Feeding:**

- (a) Light diet : For about 3 days before
(b) Sterile water sips only : From previous evening
(r) Nothing by mouth
- Ind: (a) 3 hours before operation
(b) Incessant vomits
(c) Suspected peptic perforation
(d) Gastroduodenal operation

(3) *Intestines :*(a) **Drainage :**

(a) Evacuants : laxatives ; purgatives

Contraind. Acute septic or obstructive lesion

(β) Gastroduodenal drainage

(γ) Colon irrigations

(b) **Antiseptics :**

: Bismuth, salol, carbon

(4) *Colon :*(a) **Washes :**

Ind : (a) Colon and rectum lesions : chronic

(β) Rectal and colon operations

Tech : (1) High enemata

(2) High irrigations

(b) **Enemata :**

Ind : Every rectal and colon operation

Contraind : (a) Acute alimentary conditions :

(a) Perforations

(β) Obstructions

Compl : (1) Perforation

(2) Paralytic ileus

Tech : (1) **High enema :**

Ind Colon and rectum non acute lesions

Contraind Acute alimentary lesions

(2) **Low enema :**

Ind. (a) Every laparotomy preparation

(b) Diagnostic

. Two enema method in acute intestinal obstruction

(c) Reflex therapeutic for micturition

Contraind Any acute alimentary lesion

(3) **Glycerine syringe :**

Ind. (a) Children and seniles

(b) Faecal impaction

(c) Acute alimentary lesion :

(a) Inflammatory

(β) Perforative

(γ) Obstructive

(4) **Nutrient enemata :**

Tech : (a) Tap water

(b) Saline and glucose

(c) Nutrient material

(d) Bile

Ind : (a) No oral feeding

(β) Addition to oral feeding :

(1) Shock

(2) Dehydration

(3) Cachexia

- Contraind • (a) Rectal irritability or proctitis
 (β) Colon and rectum operations
 (5) **Medicated enemata :**
 (a) Constipative
 Starch and opium
 (b) Sedative
 Chloral, bromide, paraldehyde
 (c) Decompressive
 50% mag sulph solution

(5) *Biliary apparatus*

- (a) **Cholagogues :** Ox bile, felamine, etc
 (b) **Biliary antiseptics :** Hexamine
 (c) **Intestinal evacuants and carminatives :**
 Carbon, bile, calomel, salines
 (d) **Pancreatic extracts**
 (e) **Hepatic supporters :** Glucose

(6) *Special treatment*

- (a) Sera coli gasgangrene
 (b) Bacteriophage intestinal

(B) *General preparation*

- (1) *Hydrotherapy* Water or saline with glucose

- Routes (a) Oral
 (b) Rectal
 (c) Subcutaneous
 (d) Intravenous
 (e) Intraperitoneal

- Ind (1) Dehydration
 (2) Acidosis
 (3) Toxaemia
 (4) Shock

(2) *Blood transfusion*

(C) *Other systems*

- (1) **Cardiovascular system**
 (2) **Respiratory system :**
 Antipneumonic prophylaxis
 (3) **Urinary system :**
 Diuretics and urinary antiseptics

(D) *Immediate pre operative treatment*

- (1) Preparation of the operative field •
 (a) Clavicles to mid thighs
 (b) Lumbar spine if under spinal
 (2) Sedative previous night
 (3) Gastric wash }
 or (3) Colon wash } in indicated cases
 (4) Enema pre operative
 (5) Catheterisation pre operative

- (6) Morphine $\frac{1}{2}$ gr + atropine 1/100 gr
Half an hour before
- (7) Adrenaline 1 c c if under spinal
10 minutes before
- (8) Intravenous saline
- Time During and after the operation
- Ind (a) Shock and dehydration
- (b) Spinal anaesthesia
- Contraind (a) Internal haemorrhage
- (b) Cardio respiratory failure

(IV) ANÆSTHESIA

(A) *General*

(a) **Chloroform.**

- Ind (1) Good relaxation
- (2) Non irritant to respiratory system
- Contraind (1) Cardiac depressant
- (2) Hepatic poison

(b) **Ether**

- Ind Stimulant
- Contraind (1) No good relaxation
- (2) Respiratory irritant
- (3) Masks the shock

(B) *Spinal*

- Ind (1) **Very good relaxation**
- (2) **Prophylaxis against ileus**
- Contraind (1) **Shock**
- (2) Urinary trouble

(C) *Infiltration* Novocain

- Tech (1) Regional subcostal and lateral
- (2) Local along the incision
- (3) Visceral (a) Splanchnic
- (b) Infiltration
- Contraind (1) Neurotic patient
- (2) Local sepsis

(D) *Intravenous sodium cyanide*

- (1) Alone
- (2) Along with local novocain **Best**

(V) CAREFUL PALPATION OF THE ABDOMEN

- (a) After deep anaesthesia
- + (b) Before the incision

(VI) TECHNIQUE OF LAPAROTOMY

(A) *Incisions*

- Principles (1) Adequate access
- (2) Direct access
- (3) Minimum damage to anatomy

- (4) Capable of extension
- (5) In the lines of strain
- (6) No injury to :
 - (a) Nerves
 - (b) Muscles
- (7) Valvular approach

Individual: (A) Incisions through the rectus and its sheath:

(a) **Transverse epigastric:**

Advant: (1) No damage to nerves
(2) Easy retraction
(3) Capable of extension
(4) *No strain on suture lines*

Disadvant. (1) Length not much
(2) Unsatisfactory exposure
(3) Unsuitable for sepsis

(b) **Oblique paracostal : Kocher**

. Parallel to and 1" below costal margin

Ind. (1) Right: biliary apparatus
(2) Left (α) Spleen
(β) Proximal stomach

(c) **Vertical:**

(v) **Paramedian:**

Tech. (1) Trans rectus . rectus split
Ind. Stomies
(2) Valvular aponeurotic :
Ind. Physiological ideal

(8) Median :

Ind. Less bleeding, rapid

Contraind Incisional hernia

Sites for vertical incisions :

(1) **Paramedian:**

(A) Supra umbilical . upper abdomen
(B) Para-umbilical : Middle abdomen
: General exploration
(C) Infra umbilical . lower abdomen, pelvis

(2) Median :

(A) Supra-umbilical : Best for emergency in upper abdomen
(B) Infra umbilical : Incisional hernia common

(B) *Incisions through lateral abdominal muscles :*

(a) **Oblique kidney incision:**
: (See under Kidney)

Ind: (1) Nephrectomy
(2) Ureteral exploration
(3) Lumbar ganglionectomy

(b) **Transverse lateral incision :**

From 2" from the outer border of erector spinæ

To Rectus sheath

Course	Half way between (α) & (β)	Costal margin Iliac crest
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(c) **T incision:**

(1) Paramedian

+ (2) Transverse lateral

Ind (1) Growths of the kidney

(2) Growths of the colon

(C) *Incisions for appendicectomyes*

(See under Appendix)

(a) **Battle's incision:**

Adv (1) Easy and direct access

(2) Valvular

(3) Division of no important structure

Disadv	(a) Non extensible without nerve trauma
--------	---

(b) Secondary hæmorrhage deep epigastric

(c) Ventral hernia

Ind (1) Right pelvic or medial appendix

(2) Perforated colon diverticulum

Tech (a) Parallel with and a little internal to right semilunar line

↓ (β) Medial displacement of rectus

(b) *Gridiron incision:*

Adv. (1) Direct access

(2) **Valvular**

(3) Line of strain

(4) Extensible

Disadv	(a) No general exploration
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(β) Post operative inguinal hernia

Ind (1) Acutely inflamed appendix

(2) Acute abdominal catastrophe

With uncertain diagnosis

Tech (a) 4" long $\frac{1}{4}$ above and $\frac{3}{4}$ rd below
(b) At right angles to
(c) Junction of outer and mid thirds of }
Spino umbilical line

(C) Morison muscle cutting incision:

Adv (a) Direct access

(β) Extensible

(r) **Good view**

(f) *Good for drainage*

Ind (a) Retrocaval appendix

(3) **Appendicular abscess**

Tech Parallel to outer third of Poupart and iliac crest with centre opposite ant sup iliac spine

(2) *Peritoneal entrance*

Note any special condition found

- (a) Escape of gas perforation
- (b) Blood hæmoperitoneum
- (c) Gastric contents gastric perforation
- (d) Bile (α) Duodenal perforation
(β) Biliary leakage
- (e) In'estinal contents intestinal perforation
- (f) Urine Bladder rupture
- (g) Fluid (1) Serous
(2) Sero sanguinous
(3) Hæmorrhagic
(4) Chylous
(5) Purulent
(6) Mucoid
- (h) Peritoneal (1) Tubercles
(2) Fat necrosis
(3) Carcinomatosis
(4) Pseudo myxoma peritonæi

(3) *Peritoneal exploration for the focus*

(A) **Go from better to worse condition** being guided

- by (a) Peritoneal exudate
- (b) Intensity of peritoneal inflammation
- (c) Distension and collapse of the intestines
- (d) Usual sites
 - (α) Upper abdomen
 - (1) Gastro duodenal
 - (2) Biliary apparatus
 - (3) Pancreas
 - (4) Transverse colon
 - (β) Middle abdomen
 - (1) Ileo cæcal region
 - (2) Appendix
 - (3) Small intestines
 - (γ) Lower abdomen
 - (1) Sigmoid colon
 - (2) Pelvic organs tubes and ovaries

(B) **Decide**

- (a) That the focus treated is really a primary focus and not a part of general manifestation of diffuse peritonitis
- (α) Focus is the culmination of severity of inflammation
- (β) Focus is inflamed more inside than on its surface

- (b) That the focus is not secondary to other focus
Pseudo appendicitis in duodenal perforation
- (c) That there is no focus additional to that which is treated

(4) *Isolation of the focal area* By abdominal packs

- (a) Count the packs
- (b) Attach artery forceps to each
- (c) Isolation from
 - (a) General peritoneal cavity
 - (b) Wound margins and skin

(5) *Treatment of the focus*

- (a) Excision
- (b) Isolation short circuit
- (c) Drainage

(6) *Peritoneal exploration for*

- (a) Complications
- (b) Associated lesions

Do not infect the uninfected parts

(7) *Peritoneal dry toilet*

(8) *Removal and counting of packs*

(9) *Closure*

- (a) Continuous medium sized catgut on round needle
For peritoneum
- (b) Interrupted catgut on sharp needle
For rectus sheath and muscle layers
- (c) Interrupted silk or silkworm
For skin
- (d) Anchor stitches

(10) *Drainage*

- Sites
- (a) Upto the focus
 - (b) General peritoneal cavity
 - (a) Suprapubic
 - (b) Rutherford Morison
Stab below tip of 11th rib
 - (c) Paracolic gutters
Lumbar stabs

(c) Intestinal drain stomy

(d) *Inter parietal*

Material

- (1) Rubber tube
- (2) Split rubber drain
With wick of strip gauze
- (3) Corrugated rubber
- (4) Glove drain
For subcutaneous spaces

Introduc.

- (a) Stab wound
- ↓ (b) Peritoneal incision

- ↓ (c) Introduction of tube by artery forceps
- ↓ (d) Anchor to the skin

(VII) AFTER-TREATMENT.

(1) *Posture :*

(A) **Position :**

(a) *Anæsthesia :*

(a) General: recumbent on one side with head low

(β) Spinal. (1) Trendelenburg for 2 hours :

Contraind (a) Abdominal sepsis

(b) Cardiac embarrass.

(c) Abdominal distension

↓ (2) Recumbent for 15 minutes

↓ (3) Fowler

(b) Laparotomy position.

(a) *High Fowler :*

Ind. (1) Perforative peritonitis

(2) Diffuse peritonitis

(3) Appendicular abscess

(β) *Low Fowler.*

Ind. (1) Unperforated appendix

(2) Intestinal obstruction

(3) Ectopic gestation

(4) Twisted ovarian cyst

+ (r) *Drained focus most dependent*

(B) **Constant change of posture**

(C) **Active movements of limbs :**

: Preventive of thrombosis

(D) Sitting up. 3 days after

(E) Walking: 3 weeks after

(F) Resumption of work 3 months after

(2) *Food:*

(a) First 12 to 24 hours :

: Water, water + glucose

(b) Second day.

· Equal parts of peptonised or citrated milk and barley water, weak tea.

(c) Third day.

: Citrated whole milk + orange or grape juice

(d) Fourth day :

Thin bread + butter + light-boiled eggs

(e) Fifth day.

: Bread + butter + milk + eggs

(f) Sixth day:

: Tapioca + bread + butter + milk + eggs

(1) **Milk:** (a) Peptonised

(b) Citrated

(c) Diluted

- (2) **Albumen water :**
 - . White of 4 eggs + one pint water + lemon + sugar
- (3) **Beef tea :** Not nutritive
 - (a) Prolonged soaking of fresh cut meat in water
 - + (b) Fresh raw meat juice
- (4) **Raisins tea :**
 - . Pour one pint of boiling water on half pound of chopped raisins
- (5) **Glucose :**
 - (a) By mouth
 - (b) By rectum
 - (c) By vein
- (3) **Evacuation :**
 - (a) Third night liquid paraffin
 - (b) Fourth morning . glycerine syringe
 - (c) Every night liquid paraffin
 - (d) Alternate morning small enema
 - (e) Purgative not within 10 15 days
- (4) **Dressings.**
 - (a) If aseptic
 - (a) Renewal of dressings 4th day
 - (β) Sutures out . 9th and 11th day
 - (b) If drainage
 - (a) Prophylactic peritoneal end of 48 hours
 - (β) Draining till it drains
slow shortening
 - (c) Elastoplast support to the wound for 3 weeks.
 - (d) Abdominal belt or corset for 3 6 months
- (5) **Convalescence**
 - (a) **Avoid straining** in any form
 - (1) Laborious occupation
 - (2) Constipation
 - (3) Dysuria
 - (4) Respiratory diseases
 - (5) Pregnancy
 - (b) Avoid friction of the wound scar
 - (c) Wear abdominal belt for 6 12 months
 - (d) Careful diet and smoking

(VIII) POST OPERATIVE CONDITIONS.

(A) *Post laparotomy symptom syndrome :*

(1) *Post laparotomy pain*

- Etio :**
- (a) Operation type protracted upper abdominal
 - (b) Technical errors
 - (a) Rough handling
 - (β) Tight sutures
 - (γ) Irritant antiseptics
 - (c) **Postural errors :**
 - (a) During operation
 - (β) Post operative
 - (d) Abdominal drains . tubes and packs

- (e) **Flatulence and urinary distress**
 (f) **Infection of the wound**
 (g) **Hypersensitive patient**
- Treat** (a) Remove the etiology
 (b) Direct treatment sedatives
- | | | | |
|-----|--------------|-------------|----------|
| (a) | Oral | (1) Aspirin | grs. x |
| | | (2) Medinal | grs. 1-x |
| (β) | Rectal | Aspirin | grs. xxx |
| | | Pot Bromide | grs. 40 |
| | | Brandy | ounce ½ |
| | | Saline | ounces 6 |
| (γ) | Subcutaneous | (1) Morphia | ½ gr |
| | | (2) Omnopon | |

(2) *Post laparotomy thirst*

- Etiology** (a) Abdominal operation
 (b) General anæsthesia
 (c) Prolonged pre operative starvation
 (d) Extreme purgation
 (e) Persistent vomiting
 (f) Excessive sweating
 (g) Primary morbid condition
- (1) Acute gastric dilatation
 (2) Gastro duodenal obstructions
 (3) Paralytic ileus
 (4) Acute peritonitis
- } **Dehydration**

Treat (A) Oral

- Give** (a) Sips of water or fresh fruit juice
 (b) Suck acid drops or lemon
 (c) Swab with glycerine borax
 (d) Frequent mouth washes

- Contraind** (a) Nausea and vomiting
 (b) Oral or œsophageal operations

Avoid Ice

(B) Proctoclysis

- Tech** (a) Murphy's continuous drip
 (b) 6 ounces every 6 hours

- Give** (a) Tap water
 (b) Normal saline
 (c) Normal saline + 5% glucose
 (d) Saline + sedatives

(C) Venoclysis

- Give** (a) Hypertonic in alkalosis and ileus
 (b) Isotonic in dehydration
 (c) Glucose in acidosis
 (d) G - r

- Contraind** (1) ,
 (2) ,

(3) *Post-laparotomy vomiting.*Etio. (a) **Anæsthesia**(b) **General conditions:**(α) **Acidosis**(β) **Uræmia**(c) **Abdominal conditions:**(α) **Acute gastric dilatation**(β) **Paralytic ileus**(γ) **Peritonitis**(δ) **Intestinal obstruction**Treat (a) **Repeated oral**(α) **Soda bi carb grs xxx**(β) **Glucose**(γ) **Adrenaline or Tr iodine**(b) **Rectal Sodium bromide grs xxx****Chloral hydras grs xxv**(c) **Stop everything by mouth**(d) **Gastric wash + drain**(α) **Ryle's tube**(β) **Soda bi carb wash**(γ) **Aspiration drainage**(3A) *Post laparotomy hæmatemesis*Etio (1) **General septic toxæmia**(a) **Abdominal**(b) **Peripheral**(2) **Gastro duodenal operations**Clinic (1) **Bright red and frequently repeated**(2) **Coffee-ground at intervals**Diff diag (1) **Gastric source**(2) **Gastric accumulation from**(a) **Oral cavity**(b) **Pharynx**(c) **Respiratory passages**Treat: (1) **Ice: To suck and on epigastrium**(2) **Adrenaline: M x every 30 minutes**(3) **Morphia: $\frac{1}{2}$ to $\frac{1}{2}$ grain**(4) **Treat the shock**(5) **General coagulants**(6) **Blood transfusion**(7) **Gastric lavage: With tepid soda-bi carb sol**(4) *Post laparotomy flatulence*Etio (a) **Pre operative chronic dyspepsia fermentation**(b) **Lack of bile**(c) **Obstructive focus**(d) **Administration of glucose and milk**(e) **Inability to strain**

- (f) Rough handling or visceral exposure
- (g) **Saline purges**

Clinic: Distension + tympanitis

- Treat: (a) **Gastric aspiration: Ryle**
 (b) Carminatives and absorbents: carbon
 (c) Flatus tube
 (d) Turpentine stupes and enema:
 : Turpentine ounce one
 + Water pints two
 (e) Repeated small doses of morphia
 (f) Pituitrin or pitressin
 (g) Eserine salicylate 1/100 gr.
 (h) **Avoid milk, glucose, saline purges**

(5) *Post laparotomy hiccup:*

- Etio: (A) **Diaphragmatic irritation due to**
 (a) Basal thoracic focus
 (b) Upper abdominal focus
 (c) **Peritonitis**
 (B) **Uræmia**

- Treat: (a) Propped up or sitting posture
 (b) **Co₂ inhalations**
 (c) Carminative sedative
 (a) Ol cajuputi m 1
 (β) Tr. Belladonna
 (γ) Atropine
 (d) Phrenic alcohol injection

(6) *Post-laparotomy retention of urine.*

- Def: (a) Absence of urination for 18-24 hours
 or (b) Complaint of inability to pass urine
 or (c) Bladder 3 finger-breadth above symphysis
 or (d) Undue frequency without control

- Etio: (a) Age any, young adults, seniles
 (b) Sex: females
 (c) Temperament. hypersensitive
 (d) Change of environment and posture
 (e) **Dehydration**
 (f) **Anæsthesia:** (a) Spinal
 (β) Prolonged ether
 (g) **Operations:** (a) Abdominal
 (β) Pelvic
 (h) **Narcosis: morphia**

- Treat: (a) **Postural and psychic treatment:**
 : Sitting posture + firm abdominal binder
 + isolation
 (b) **Hot bottle or stupes to hypogastrium**
 (c) **Hot water enema**
 (d) **Plenty of fluids by all available routes**

(e) Drugs:

- (1) Oral: (a) Hexamine grs. xv
 (b) Piperazin grs. x
 Pot citras grs x
 Pot. acetas grs x
 Inf. buchu ad ounce 1
 : Six hourly
 (c) Pot acetas drachm i in milk
 . Every two hours
 (d) Carbachol or Moryl tablets
- (2) Injections:
 (a) Pilocarpine 1/12 gr.
 (b) Acetylcholin 5 gm.
 (c) Pituitrin 1 c c
 (d) **Doryl or Moryl 1 c.c.**
 (e) Uritone one ampoule
 (f) Hexamine intravenous
 10 grs in 20 c c. sterile water
 (g) Glucose intravenous

↓ (f) **Aseptic catheterisation:**

With administration of urinary antiseptics

(B) *Post-laparotomy peritoneal conditions:*

- (1)
- Post operative peritonitis and residual abscesses:*
-
- . (See under Peritonitis)

- (2)
- Post operative intestinal obstruction:*

(A) **Immediate:**

- (a) Mechanical (α) Focus left untreated
 (β) Technical mistake
 (b) **Paralytic ileus:** (See under Intestines)

(B) **Intermediate:** After 3 weeks

Due to inflammatory adhesions

(C) **Late:** After 3 months to years

- (a) Due to fibrosis (α) Stenosis
 (β) Adhesions
 (b) Due to obstructed ventral hernia

- (3)
- Post operative acute gastric dilatation*
-
- (See under Stomach)

(C) *Post-laparotomy local complications:*

- (1)
- Post operative sepsis of the incision:*

Etiology: (a) **Laxity in asepsis:**

- (α) Surgeon and his assistants
 (β) Preparation of the operation area
 (γ) Instruments and apparel
 (δ) Mouth and nose sepsis
 (u) Dressings

(b) **Technical errors:**

- (α) Rough handling

- (β) Inadequate wound protection .
 - (1) Skin protection
 - (2) Margins protection
 - (3) Viscera protection
 - (4) General peritoneal cavity protection
 - (5) Post operative wound protection
- (γ) Imperfect hæmostasis
- (δ) Unsuitable ligatures and sutures
 - (1) Unabsorbable ligatures
 - (2) Ligature en masse
 - (3) Tight sutures
 - (4) Septic or exposed suture material
- (α) Same scalpel for skin and deeper tissues
- (t) No parietal drain in septic cases
- (c) **Nature of operations :**
 - (α) Septic conditions
 - (β) Open trauma
 - (γ) Intestines and colon
Obstructions
- (d) **Lack of resistance to infection :**
In the patient

clinical types (a) Stitch abscess .

- Etio Septic ligature
- Clinic (1) Tender spot
 - ↓ (2) Soft spot
 - ↓ (3) Sinus if non absorbable
- Compl Non healing sinus
- Treat (1) Fomentations
 - ↓ (2) Drainage
 - + (3) Removal of the stitch
- (b) **Margin infection :**
 - Clinic (1) Tender, red margins
 - (2) Gap between margins under epithelium
 - (3) Non union of margins
 - Treat (1) Introduction of probe
To drain accumulated serum
 - (2) Removal of a stitch

(c) Peri-wound abscess :

- Etio (1) Infected ligature or suture
- (2) Infected hæmatoma
- (3) Liquefaction of fat
- Clinic Signs of abscess
- Treat . (1) Conservative .
 - (α) Local fomentations
 - (β) General sulphonamides
- (2) Operative
 - (α) Removal of sutures
 - (β) Incision and drainage

(3) Specific :

- (α) Tuberculosis
- (β) Actinomycosis
- (γ) Regional enteritis
- (δ) Malignancy

Treat : (1) Treat the etiology
 (2) Scraping or excision

(h) Secondary hæmorrhage :

Etio : (1) Suppurative myositis
 (2) Pressure of drainage tube

Site . Battle's incision deep inf. epigastric art

(2) *Post operative fæcal fistula* : (See under Intestines)

- Etio : (a) Drainage tube pressure
 (b) Leakage from anastomosis
 (c) Local trauma or gangrene
 (d) Specific infection tuberculosis
 (e) Carcinoma
 (f) Internal intestinal fistula
 (α) Bursting stump
 (β) Leaking anastomosis
 (γ) Premature stimulation of peristalsis :
 : Hasty enema
 (g) Drainage of local perforative abscesses

Clinic . Discharge of fæculent or fæcal material

Morb.anat : (α) Lined by granulations
 (b) Lined by mucous membrane

Compl : Skin irritation

Treat : (A) **Conservative :**

- (a) Diet :
 · Semi starvation with restricted fluids
- (b) Medicines .
 (α) Bismuth oxy carb : 30 grs. six hourly
 (β) Pulv-crætæ aromat : 21 four hourly
- (c) Enemata and bowel washes :
 : Every morning
- (d) Irrigations : with hydrogen peroxide
- (e) Dressings : skin protection
 (α) Horse serum
 (β) Zinc castor oil
 (γ) Mercury subchloride :
 : 30% in lanoline

↓ (B) **Love's obturator method**

↓ (C) **Operative :** (See under Intestines)

Sequelæ . (1) Adhesions
 (2) Ventral hernia

(3) *Post-operative burst-abdomen :*

Predisp : (a) **General debility and diseases**

- (b) **Nature of the condition :**
 - (1) Biliary diseases with jaundice
 - (2) Visceral carcinoma
 - (3) Suppurative peritonitis
 - (4) Acute pancreatitis
 - (5) Ascites
- (c) **Operative technique :**
 - (1) Upper abdomen incision
 - (2) Magnitude of incision
 - (3) Viscera operated upon
 - (a) Stomach
 - (β) Duodenum
 - (γ) Gall bladder
 - (δ) Pancreas
 - (ι) Spleen
 - (4) Septic contamination of the wound
 - (5) Necessity for drainage
- Exciting (a) **Errors in operative technique :**
 - (1) Type of incision non valvular
 - (2) Damage to the wound margins
 - (3) Prematurely absorbable sutures
 - (4) **Continuous suture in parietes**
 - (5) **Insinuation of omentum :**
: Between the edges of peritoneum
- (b) **Occurrence of certain post-oper. compl. :**
 - (a) **Undue strain :** Due to
 - (1) Imperfect anæsthesia
 - (2) Pulmonary complications
 - (3) Persistent vomiting
 - (4) Persistent hiccup
 - (5) Constipation
 - (6) Dysuria
 - (7) Delirium
 - (8) Repeated passage of gastric tube
Retching and straining
 - (β) **Infection of the wound**
 - (γ) **Action of the ferments :**
 - (1) Stomach
 - (2) Duodenum
 - (3) Biliary passages
 - (4) **Pancreas**
- Types. (a) **Acute total :**
: Rapid through and through
With prolapse of the intestines
- (b) **Interno-external :**
Path · Internal failure of sutures
· Only skin and subcut. tissues intact

- Clinic: (a) Soft gap between margins
(β) Peristalsis visible through the skin

(c) **Externo-internal:**

- Path: Non union or tearing of superficial wound
: Granulation lined (α) Peritoneum
Or (β) Intestinal coils

Clinic: Granulation lined red mass seen between the widely separated wound margins

- Clinic: (1) Prolapse of the intestines. total
(2) Subcutaneous intestines: interno external
(3) Partial bursting of the wound. with
(a) Pink blood stained exudate
(b) Fleshy, plum coloured mass

Time. 7th to 9th post-operative day

Treat: (A) **Prophylactic:**

- (a) Avoidance of undue trauma
- (b) **Complete hæmostasis**
- (c) Accurate coaptation
- (d) Complete relaxation of abdominal wall
- (e) Obliteration of dead spaces
- (f) **Complete asepsis**
- (g) **Supporting sutures**
- (h) **Avoidance of straining**
- (i) **Interrupted sutures in parietes**
- (j) **Careful coaptation of peritoneum**
- (k) **Avoid through & through sutures**
- (l) **Valvular approach**

(B) **Therapeutic:**

(a) **Resuture:**

- (1) Cover with warm saline pads
- (2) Morphia or omnopon
: With scopalamine
- (3) Avoidance of straining
- (4) Anæsthesia
- (5) Reduction of the prolapse:
: After toilet if necessary
- (6) Resuture the wound:
(a) Through and through silk
(b) Interrupted mattress 20d. catgut
(c) Silver wire method

(b) **Tampon:**

- Ind: (1) Bad general health
(2) Foul suppurating wound
(3) Localised rupture
(4) Purulent peritonitis

- Tech (1) Replace the protrusion
 (2) Pack the wound
 Gauze in paraffin and flavine
 (3) Elastoplast dressings
 Every third day
- After treat Abdominal corset
- Sequelæ (1) Ventral hernia
 (2) Adhesions

(D) *Post laparotomy general complications*

- (1) *Post operative shock*
 (See under Shock)

- Varieties (a) Nervous or mental shock morphia
 (b) Traumatic shock
 Delicate handling
 (c) Dehydration shock
 Fluids
 (d) Toxic shock
 Treat the toxæmia
 (e) Peritonism
 (f) Splanchnic shock
 Prophylactic block

- (2) *Post operative toxæmia*
 (See under Peritonitis)

- (3) *Post operative acidosis*

- Etio (a) Children
 (b) Diabetes
 (c) Inefficient liver
 (d) Prolonged general anæsthesia
- Clinic (1) Shock circulatory failure
 (2) Vomiting
 Persisting for more than 48 hours
 (3) New mown hay breath
 (4) Rothera's test for acetone
- Treat (A) Glucose
 (a) Rectal 8 ounces of 10% glucose
 In saline four hourly
 (b) Subcutaneous 5% glucose
 (c) Intravenous 5% glucose in saline
 + (B) Insulin
 (C) Soda bi-carb

(E) *Post laparotomy respiratory complications*
 (See under Respiratory System)

- (1) *Post-operative pneumonia*

- Etio (a) Operation during respiratory infection
 (b) Exposure under shock
 (c) General anæsthesia ether

- (d) Hypostasis
 (e) Deficient æration abdominal wound
 (f) Embolic septicæmic
 (g) Toxic
 (h) Too much venoclysis
 (i) Aspiration vomit under general anæsthesia
- Prophylax (a) Avoidance of operation in resp infections
 (b) No exposure
 (c) Avoidance of prolonged anæsthesia
 (α) Cyanosis
 (β) Ether
 (d) Frequent changes in posture
 (e) Breathing exercises
 With antiseptic and stimulant inhalations
 (f) Prevention of embolism and toxæmia
 (g) No venoclysis in cardio vascular disease
 (h) Pre anæsthetic stomach wash or drain
 (i) Measures
 (α) Turpentine stupes to the chest
 (β) Injections A S A
 Camphor in oil
 Transpulmin
 (γ) Mist. expectorans
- (2) *Other lung complications*
 (A) Collapse of the lung
 (B) Œdema of the lung
 (C) Pulmonary embolism
- (Γ) *Post laparotomy distant complications*
 (1) *Post operative acute suppurative parotitis.*
 (See under Parotid)
- Etio (a) Dryness of the mouth
 (α) Dehydration
 (β) Atropine
 (b) Oral sepsis
 (c) Oral inactivity nothing by mouth
 (d) Septic abdominal lesions
 (e) General toxæmia
- Time 3 to 10 days after operation
- Clinic Acute parotitis
- Treat (1) Oral hygiene
 (a) Attention to septic foci
 (b) Gargles
 (c) Sialagogues: Lemon to the tongue
 (2) Fomentations and antiphlogistic
 (3) Incision + drainage:
 Ind No subsidence till 5th day
 In spite of conservative measures

- (a) Rapid increase in swelling
- (b) Inflammatory oedema
- (c) High temperature
- Tech (a) Incision 1" parallel to facial nerve
 ↓ Hilton's method
- (b) Blair's method
- (2) *Post operative thrombophlebitis*
- Etio (a) Age over 40
- (b) Obesity
- (c) Sepsis
- (d) Previous phlebitis
- (e) Varicose veins
- (f) Operations (1) Splenectomy
- (2) Caesarean section
- (3) Cholecystectomy
- (4) Prostatectomy
- (5) Appendicectomy
- (6) Herniotomy
- (g) Fowler's position with
 Knee pillow or air cushion
- Clinic (a) Pain along the vein
- (b) Tender cord like swelling
- (c) Cyanosed and oedematous limb
- (d) Pyrexia
- (e) Leucocytosis
- Compl (1) **Pulmonary embolism**
- (2) **Elephantoid oedematous leg**
- (3) Eczema and ulceration
- (4) Recurrent phlebitis
- Prophylax (a) **Free movements of the limbs**
- (b) **Exercises**
 (a) Breathe deep
- (β) Spit hard
- (γ) Wave legs and arms
- (c) Thyroid extract
- (d) Pre operative proximal elastoplast
 If varicose veins
- (e) Injections
 Atropine 1/100 gr + Ephedrine ½ gr
 Three injections on alternate days
 From fifth post operative day
- Treat (See page 146)
- (a) Posture flat on back
- (b) Sedatives for pain
- (c) Immobilisation and support

- (α) Splint: for 3 weeks
- ↓ (β) Elastoplast: for 3 months
- ↓ (γ) Elastic stockings: for 6 months

(3) *Post-operative bedsores:*

- Etiology: (α) General debility
 (b) Toxæmia
 (c) Local devitalisation
 (d) Pressure + dirt + moisture
 (e) Spinal cord or nerve lesions

Sites: Bony prominences: sacrum, trochanters, etc.

Clinic: (See page 31)

Treat. (See page 32)

- (a) Efficient nursing
- (b) Relief of pressure
 - (α) Change of posture
 - (β) Air cushion
 - (γ) Elastoplast
- (c) Dryness and cleanliness:
 - (α) Frequent attention
 - (β) Drainage of discharges
 - (γ) Talcum or bismuth sub gallate
- (d) Applications
 - Absolute alcohol
 - Tannin
 - . Formalin 1%
 - . Friars' balsam
 - . Collodion
 - . Mastisol
 - . Whitehead's varnish
- (e) Surgical procedures.
 - (α) Removal of sloughs
 - ↓ Eusol or hydrogen peroxide
 - (β) Skin grafting
 - (γ) Sympathectomy

(G) *Sequelæ of abdominal operations*

- (1) Local: (α) Scar irregularities
- (b) Incisional or ventral hernia
- (2) Abdominal: (α) Adhesive intestinal obstruction
- (b) Post operative constipation
- (3) Abdominal neurosis: dyspepsia

(IX) IMPORTANT POINTS

- (1) Gauze as a drainage material is unsound, it soaks up pus or blood, which dries up, acts as a plug and hinders drainage; it also sticks to internal viscera and causes damage at the time of removal

- (a) Rapid increase in swelling
- (b) Inflammatory oedema
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(3) **Abdominal neurosis: dyspepsia**

(IX) IMPORTANT POINTS

- (1) Gauze as a drainage material is unsound, it soaks up pus or blood, which dries up acts as a plug and hinders drainage, it also sticks to internal viscera and causes damage at the time of removal

- (2) A correct pre operative diagnosis is the hand maiden of a successful laparotomy.
- (3) Silk suture is better for parietes, provided asepsis is assured
- (4) *A suprapubic drainage tube must project above the skin level for about half an inch*
- (5) *Never use any swab in the abdominal cavity unless it is taped and the tape secured by artery forceps*
- (6) *Never forget to count the swabs before commencing the peritoneal suture*
- (7) Abdominal pain below the age of 5 :
 - (a) Worms
 - (b) Intussusception
 - (c) Ileo colitis
 - (d) Henoch's purpura
- (8) Abdominal pain in children above 5
 - (a) Worms
 - (b) Appendicitis
 - (c) Inflamed mesenteric glands
 - (d) Abdominal tuberculosis
 - (e) Pneumococcal peritonitis
 - (f) Pneumonia
 - (g) Influenza
 - (h) Spinal disease
 - (i) Muscular strain
- (9) *No aperient should ever be given in a case of acute abdominal pain, if there is a least suspicion of a local inflammatory lesion*
- (10) *Best incisions for general exploration of the abdomen :*
 - (a) *Supra umbilical median*
 - (b) *Para or infra umbilical paramedian.*
- (11) Pure milk gives rise to flatulence.
- (12) *Beware of laparotomy in*
 - (a) *Laborious workers*
 - (b) *Child bearing aged females*
 As it is a predisposer of ventral hernia.
- (13) *It is far better to enlarge a laparotomy incision than to pull and drag on an intraperitoneal viscus through a cramped space*
- (14) *Never forget to palpate the whole of the abdomen thoroughly after the patient is under and before the actual operation begins.*
- (15) *Common complications of intraperitoneal drainage tube .*
 - (a) *Paralytic ileus*
 - (b) *Fæcal fistula .*
 - (c) *Secondary hæmorrhage*
 - (d) *Ventral hernia*
 - (e) *Adhesions*

- (16) Tilting the patient in such a way as to favour internal drainage of infected peritoneal fluid into the pelvis—Fowler position—is the greatest advance in surgery since Lister days
- (17) *Take care to see that a peritoneal drainage is always dependent, if not, adjust the posture likewise*
- (18) *Take greatest care to see that*
 - (a) *The patient is never turned on his sound side in a localised peritonitis*
 - (b) *The sterile parts of peritoneal cavity are not contaminated by exploration after dealing with a septic primary focus*
 - (c) *No complication of the primary focus treated at the laparotomy, is overlooked*
- (19) Unless there are contraindications, patient should be encouraged to use his arms move his legs and alter his position in bed as often as he may feel inclined
- (20) Fowler's position relieves post operative pain
- (21) Adjust the bandages shortly after the patient comes fully round from the anaesthesia
- (22) *Avoid ice after a laparotomy, it is a precursor of gastric paralysis.*
- (23) When called to see a patient with post operative distended abdomen, remember full bladder
- (24) 75% of all cases that require catheterisation develop cystitis
- (25) *Fat patients with short necks are the worst enemies of surgery on account of*
 - (a) Heart failure
 - (b) Post-operative pneumonia
- (26) Post operative alimentary paralytic syndrome
 - (a) Acute gastric dilatation
 - (b) Paralytic ileus
- (27) Causes of post operative alimentary paralytic syndrome
 - (a) Continuation of pre operative condition
 - (b) Trauma rough handling and exposure
 - (c) Toxaemia peritonitis
 - (d) Reflex
 - (e) Obstruction + lack of propulsive power
- (28) *For every laparotomy, claustrics to mid thighs must be prepared*
- (29) In general peritonitis
 - (a) Drain the infected focus
 - (b) Drain the peritoneal pouches
 - (c) Drain the muscular and subcutaneous planes of the wound

- (30) In the treatment of a septic focus in peritoneal cavity, take good care to isolate it from general peritoneal cavity before its treatment. Do not, on any account, contaminate the sterile parts of the general peritoneal cavity either by gravity or by direct touch at the time of exploration.
- (31) In all cases where frequent applications of hot fomentations to the skin are required, protect the skin with thick coating of zinc and castor oil ointment.
- (32) Differential diagnosis is difficult between
 - (a) Faecal fistula
 - (b) Discharging hæmatoma
Infected by B coli
- (33) 80% of all faecal fistulae are due to caecal sloughing after operations on gangrenous appendix.
- (34) A faecal fistula will not close spontaneously if the mucous membrane of the gut is continuous with the skin.
- (35) Hypertonic and constant intravenous drip are most likely to produce phlebitis.
- (36) Liability to phlebitis is one of the contraindications for operations of choice.
- (37) Fowler's position is a great predisposer of phlebitis; patients should at least be allowed to lie down to sleep at night.
- (38) If abdomen has been opened in an unsuitable place, there are two alternatives
 - (a) Extension of exploratory incision
 - (b) Closure of the exploratory incision
↓ Fresh directly overlying incision
- (39) Three kinds or stages of exploratory incisions
 - (a) Small diagnostic incision
 - ↓ (b) Medium therapeutic incision
 - ↓ (c) Large, extended incision for extra exposure.
- (40) An intra abdominal lesion associated with toxæmia, anaemia and cachexia, predisposes to burst abdomen.
- (41) Burst abdomen occurs with equal frequency after local, spinal and inhalation anaesthesia.
- (42) Most common causes of burst abdomen

(1)	"	"	"	of suture
(2)				
(3)				
(4)	Sepsis			
(5)	Digestive ferments			
- (43) Characteristic of perforated peptic ulcer, is the 'instantaneous' onset.

- (44) *Best preventer of burst abdomen is a valvular incision*
- (45) *Difficulties in suturing an abdominal wall .*
- (a) *Rigid abdomen*
 - (b) *Retraction of peritoneum*
 - (c) *Very thin peritoneum*
 - (d) *Evisceration due to straining*
 - (e) *Sutures giving way*
 - (f) *Injury to intestines*
- (46) *Peritoneal incision and suture rules*
- (a) *Raise the peritoneal edges*
 - (b) *Incise and suture in full inspiration*
 - (c) *Hold the scalpel horizontal*
 - (d) *Be sure that nothing lies against the peritoneum*
 - (e) *Take care not to prick the intestines by the needle.*
-

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- (42) *Most common causes of burst abdomen*
 - (1) *Insinuation of omentum*
Between peritoneal edges at the time of suture
 - (2) Intermittent and *sudden strain*
 - (3) Rapidly absorbable sutures
 - (4) *Sepsis*
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- (30) In the treatment of a septic focus in peritoneal cavity, take good care to isolate it from general peritoneal cavity before its treatment. Do not, on any account, contaminate the sterile parts of the general peritoneal cavity either by gravity or by direct touch at the time of exploration.
- (31) In all cases where frequent applications of hot fomentations to the skin are required, protect the skin with thick coating of zinc and castor oil ointment.
- (32) Differential diagnosis is difficult between
 - (a) Faecal fistula
 - (b) Discharging hæmatoma
Infected by *B. coli*
- (33) *80% of all faecal fistulae are due to caecal sloughing after operations on gangrenous appendix*
- (34) A faecal fistula will not close spontaneously if the mucous membrane of the gut is continuous with the skin.
- (35) Hypertonic and constant intravenous drip are most likely to produce phlebitis.
- (36) Liability to phlebitis is one of the contraindications for operations of choice.
- (37) *Fowler's position is a great predisposer of phlebitis*, patients should at least be allowed to lie down to sleep at night.
- (38) If abdomen has been opened in an unsuitable place, there are two alternatives
 - (a) Extension of exploratory incision
 - (b) Closure of the exploratory incision
↓ Fresh directly overlying incision
- (39) Three kinds or stages of exploratory incisions
 - (a) Small diagnostic incision
 - ↓ (b) Medium therapeutic incision
 - ↓ (c) Large, extended incision for extra exposure.
- (40) An intra abdominal lesion associated with toxæmia, anæmia and cachexia, predisposes to burst abdomen.
- (41) Burst abdomen occurs with equal frequency after local, spinal and inhalation anaesthesia.
- (42) *Most common causes of burst abdomen*
 - (1) *Insinuation of omentum*
Between peritoneal edges at the time of suture
 - (2) Intermittent and sudden strain
 - (3) Rapidly absorbable sutures
 - (4) *Sepsis*
 - (5) *Digestive ferments*
- (43) Characteristic of perforated peptic ulcer, is the 'instantaneous' onset.

- (44) *Best preventer of burst abdomen is a valvular incision*
- (45) *Difficulties in suturing an abdominal wall*
- (a) *Rigid abdomen*
 - (b) *Retraction of peritoneum*
 - (c) *Very thin peritoneum*
 - (d) *Evisceration due to straining*
 - (e) *Sutures giving way*
 - (f) *Injury to intestines*
- (46) *Peritoneal incision and suture rules*
- (a) *Raise the peritoneal edges*
 - (b) *Incise and suture in full inspiration*
 - (c) *Hold the scalpel horizontal*
 - (d) *Be sure that nothing lies against the peritoneum*
 - (e) *Take care not to prick the intestines by the needle*
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-

GENITO-URINARY SYSTEM

CHAPTER I

URINARY EXAMINATION AND ABNORMALITIES

(A) URINARY EXAMINATION

- (1) CHEMISTRY, CYTOLOGY & BACTERIOLOGY
- (2) URETHROSCOPY

(A) Anterior

(B) Posterior

- (3) CYSTOSCOPY

Ind (A) Diagnostic :

(a) Bladder conditions (stone, growth, cystitis, prostate, diverticulum, etc.)

(α) Air bubble fundus

(β) 4 and 8 o'clock ureteral openings

(b) Ureteral conditions (calculus, T B, etc.)

(c) Kidney conditions

(B) Therapeutic :

(a) Bladder conditions . fulguration

(b) Ureteral conditions ureteral stone

(c) Kidney conditions pelvic lavage

Tech (A) Simple cystoscopy

(B) Chromo-cystoscopy :

Routes (a) Intramuscular

(b) Intravenous

Solutions (a) Indigo carmine 4 c.cs of 0.4%

(b) Phenol sulphone phthalein

(c) Methylene blue 1-2 c.cs

Results (a) Time of appearance

(α) 5-7 minutes after intravenous

(β) 15-20 minutes after intramuscular

(b) Depth of the colour

- (4) URETERAL CATHETERISATION

Ind (a) Patency test

(b) Collection of kidney urine

(c) Renal lavage or instillations

(d) Opaque catheter → X Ray

(e) Instrumental pyelography

(f) Instrumental treat. of ureteral stone or stricture

Catheters (1) Material gum elastic

(2) Length . 30 inches

- (3) Size **Charrriere 4-16**
- (4) Types (a) Olivary
(b) Whistle tip
- (5) Marks alternate dark and light areas of 1 cm rings every 5 cms
- (6) Kinds (a) Opaque
(b) Non opaque
- Guides (a) Inter ureteric bar
(b) Ureteric openings
4 and 8 o clock of the cystoscopic disc

(5) **X RAY****(A) Plain X Ray**

- Ind (a) Lumbar pain
(b) Renal colic
(c) Kidney swelling
(d) **Suspected calculus**
- Planes (1) Antero posterior
(2) Lateral

(B) X Ray with opaque ureteric catheter

- Ind Suspected ureteric stone

(C) Pyelography**(1) Descending or intravenous**

- Preparation (a) Enema night before
(b) Enema 30 min before
(c) Intramuscular pitressin 5 c cs
(a) One hour before
(β) Half an hour before
- Inj 20 c cs of warm sterile sol of uroselectan B
Into median basilic vein
(8 c cs. in infants 12 c.cs in children)
- Points (a) **Avoid leakage outside the vein**
(b) Injection rate 10 c cs a minute
(c) Use large bored needle
(d) Inject few c cs of saline at the end
To prevent thrombosis
- X Ray **(A) Time**
(a) 5 minutes
(b) 15 minutes
(c) 30 minutes
(d) 45 minutes
(e) 90 minutes
(f) 150 minutes
- (B) Position**
(a) Trendelenburg with abdominal compress
(b) Standing in mobile kidney

(2) *Ascending or instrumental*

Ind	Renal growths, hydronephrosis, calculus, etc
Contraind	(a) Acute urinary tract inflammations (b) Urinary tract obstructions (c) Chronic urinary tract inflammations Tuberculosis (d) Uræmia
Anæsth	Urethral cocain bicarbonate
Position	Lithotomy
Tech	(a) Pass the cystoscope ↓ (b) Wash out and distend the bladder ↓ (c) Pass No 5 Charriere ureteric catheter ↓ (d) Withdrawal of cystoscope ↓ (e) Plain X Ray plate ↓ (f) Aspiration of pelvic contents ↓ (g) Injection of warm sterile solution of 12% sodium iodide or 20% sod bromid Till discomfort in the loin (Normal quantity 7 c cs) ↓ (h) X Ray plate ↓ (i) Aspiration of solution ↓ (j) Third X Ray plate
Methods	(1) Injection (2) Gravity raise the solution receptacle feet above the patient
Varieties	(a) Pyelogram (b) Ureterogram (c) Cystogram
Normal pyelogram	(Uniform density & razor sharp margins)
(1) Pelvis	(a) Trumpet shaped (b) Upper edge f shaped (c) Lower edge semicircle (d) No bulging on inner aspect of pelvis beyond ure
(2) Calyces	(a) Major three (upper in line of ureter) (b) Minor six to nine (c) Cup-shaped
(3) Positions	(a) Pelvi ureteral junction Opposite transverse process of 2 L (b) Calyces (a) Upto 11th rib above (3) Up to transverse process of 3 L below
Abnormal pyelogram	
(1) Pelvis	(a) Alteration in size back pressure (b) Alteration in shape back pressure new growth

- (d) Alteration in density T B, calculus
- (e) Alteration in pelvi-ureteral junction
- (f) Duplication
- (2) *Calyces*
 - (a) Changes in outline clubbing
In back pressure
 - (b) Changes in size
In back pressure
 - (c) Changes in density mottling or fluffiness
In T B
 - (d) Changes in shape
In new growths or polycystic kidney
 - (e) Obliteration of plain X Ray shadow
Stone
 - (f) Changes in position
Mobility or congenital misplacements
- (3) *Ureter*
 - (a) Changes in size hydro-ureter
stricture ureter
 - (b) Changes in outline T B ureter
 - (c) Changes in course mobile kidney
 - (d) Changes in number double ureter

Dangers and difficulties of pyelogram

- (A) Intravenous
Tissue necrosis due to perivenous escape
- (B) Retrograde
Renal trauma
- (C) Both
 - (a) Uncontrollable colitis
 - (b) Iodism

(6) RENAL FUNCTION TESTS

(A) Clinical features of uræmia :

- (a) Nervous headache, drowsiness, convulsions
- (b) Respiratory dyspnœa
- (c) Gastro intestinal
 - (a) Thirst
 - (b) Vomiting
 - (c) Parrot dry tongue
 - (d) Dyspepsia
 - (e) Tympanitis
- (d) Urinary
 - (a) Polyuria
 - (b) Oliguria
 - (c) Anuria

(B) Examination of the urine :

- (a) Quantity
 - (a) Polyuria
 - (b) Oliguria
 - (c) Anuria
- (b) Specific gravity high or low

- (c) Chemical exam **urea content**
 sugar
 albumin
- (d) Microscopical exam **renal casts**
- (C) **Renal tests :**
 - (a) **Chromocystoscopy :** (See above)
 - (b) **Intravenous pyelography** (See above)
 - (c) Ureteral catheterisation
 - (a) Urine from each renal pelvis
 - (b) Ascending pyelography
- (D) **Elimination or retention tests :**
 - (a) **Urine .**
 - (1) **Urea concentration test :** (Maclean's)
 - No fluids for 12 hours
 - ↓ 15 gms of urea in 100 c cs of water by mouth
 - ↓ Collect the urine every hour for three hours
 - Normal % of urea in 2nd and 3rd hours > 2*
 - (2) Urea split function test
 - Urea 15 gms. in 100 c.cs of water by mouth
 - ↓ Ureteral catheterisation
 - ↓ Withdrawal of urine from each kidney
 - After 1½ hour
 - ↓ Estimation of urea
 - (3) Urine diastase test
 - (b) **Blood . (Urea and N P N)**
 - Blood urea test
 - Withdrawal of 5 c cs of blood
 - ↓ Injection into a test tube containing ca oxalate
 - ↓ Estimation of urea
 - Normal blood urea 20-40 mgms per 100 c cs*

(B) URINARY ABNORMALITIES

(I) POLYURIA

- Etio
- (a) **Chronic interstitial nephritis**
 - (b) **Diabetes**
 - (c) Diuretics and hydrotherapy
 - (d) Changes in weather and climate
 - (e) Nervous

(II) OLIGURIA AND ANURIA

- Def
- (A) Oliguria diminished secretion of urine
 - (B) Anuria total suppression of urine

- Etio
- (A) **Hysterical anuria**
Temporary, no uræmia
 - (B) **Blood pressure anuria**
Shock

(C) Dehydration anuria

- Etiology** (a) Pronounced vomiting
 (β) Pronounced diarrhoea
 (γ) Pronounced perspiration

(D) Reflex anuria :

- (a) Urethral instrumentations
 (b) Bladder operations
 (c) Ureter impacted stone
 (d) Kidney acute inflammation

(E) Back-pressure anuria

- (1) **Urinary obstruction :**
 (a) Gradual enlarged prostate
 (b) Sudden calculus anuria
 (2) **Sudden decompression :**
 After prolonged acute retention

(F) Destruction anuria Renal failure

- (1) Gradual hydro or pyo nephrosis
 (2) Sudden removal of only functioning kidney

(G) Infective anuria

- (1) "

(2) Ascending urinary .

- (a) **Primary :**
 Urethritis → cystitis → pyelitis
 (b) **Post operative :**
 Operations or instrumentations on
 acute or chronic urinary sepsis

Path (A) Pre renal anuria :

Circulatory causes

(B) Renal anuria :

- (a) Renal destruction or removal
 (b) Renal sepsis
 (c) Renal inhibition

(C) Post renal anuria :

- (a) Obstruction
 (b) Infection
 (c) Irritation
 (d) Trauma
- } of lower urinary passages

Diff diag (1) From retention of urine .

- (a) No palpable bladder or peri vesical cellulitis
 (b) Catheterisation easy + no urine
 (c) Urinary toxæmia

(2) From rupture bladder :

- (a) No history of trauma

- (b) No extravasation of urine :
 (α) Peritoneal
 (β) Extraperitoneal
- (3) From recently evacuated bladder :
 : History

Treat. (A) *Medical*.

- (a) **Diuretics :**
 (α) **Fluids :** (1) Mouth
 (2) Rectum
 (3) Subcutaneous
 (4) Intravenous
 (β) **Oro-therapy**
 (γ) **Intravenous :**
 (1) **Isotonic sodium sulphate :**
 42.85 gms of Glauber's salt in
 1 litre of water
 (2) Glucose 20%, 25 c.cs.
 (3) Saline
 (b) **Evacuants :**
 (α) Purges saline
 (β) Sudorifics pilocarpine
 (c) **Local :** Hot packs, cupping to loins
- (B) *Surgical*.
 (a) **Removal of etiology :**
 (α) Obstruction
 (β) Sudden decompression
 (b) **Continuous gradual drainage :**
 (α) Indwelling catheter urethral or ureteric
 (β) Suprapubic cystostomy
 (γ) Nephrostomy

Compl **Uræmia :**

Treat **Re establishment of urinary flow :**

- (1) **Urinary drainage :**
 (α) Urethral catheter
 (β) Cystostomy
 (γ) Ureteral catheter
 (δ) Nephrostomy
- (2) **Hydrotherapy :**
 (α) Oral
 (β) Rectal
 (γ) Subcutaneous
 (δ) Intravenous
- (3) **Diuretics :**
 (α) Oral : Pot. citras grs. ʒ
 Pot. acetas grs. x
 Spt. aeth nitrosi m xxx
 Inf. buchu ounce 1

- (b) Intravenous
 - (a) Glucose saline
 - (β) Sodium sulphate isotonic
- (4) Purgatives Salines
- (5) Diaphoresis (a) Pilocarpine 1/60 gr
(b) Hot packs
- (6) Local Cupping
- (7) Surgical measures
 - (A) Peritoneal lavage Repeated
Tech (a) Pass a catheter in upper peritoneum
(b) Run in saline
(c) Pass a catheter above the pubes
(d) Drain
 - (B) Renal decapsulation
 - Or (C) Nephrostomy + intravenous sodium sulphate

(III) BACILLURIA

- Def** Presence of bacilli in urine with latent inflammation of the urinary tract
- Etiology** (1) Haematogenous Descending
(2) Ascending From lower urinary tract
(3) Migration Local invasion from neighbours
B. coli from intestines
- Bacteria** (A) Acid urine
(a) B. coli
(b) Gonococcus
(c) B. Typhosus
(d) T. B.
(B) Alkaline urine Urea splitting organisms
(a) B. proteus
(b) Staphylococcus
(c) B. pyocyaneus
- Clinic** (A) Cloudy fishy urine
(B) Reaction (a) Acid coli bacilluria
(b) Alkaline urea splitting organisms
(C) Urinary irritation
(a) Burning micturition
(b) Enuresis
(D) Signs
(a) Microscopical examination
(b) Cultural examination
- Complications** Ascending or descending urinary sepsis
- Treatment** (1) Diuretics
(a) Fluids
(b) Oral medication dry cal chloride
(c) Intravenous sodium sulphate
(2) Urinary chemical opponents

(A) *For acid urine Alkalies + antispasmodics*

(a) **Pot. citras** grs 60

in water ounce $\frac{1}{2}$ + syrup of oranges

Dose 2 hourly for 8 hours

↓ 4 hourly for 36 hours

(b) Soda bi carb

(B) *For alkaline urine Acidifiers + hexamine*

(a) Acid sodium phosphate

(b) **Acid ammonium phosphate.**

2 grams T D S

(c) Nitrohydrochloric acid

\mathcal{R} acid nitrohydrochlor fortis ziv

Aqua destillata ounces iv

Dose zi in a glass of water after meals

(d) 1% phosphoric acid sol irrigations

(C) *Sodium citrate treatment*

Tech (a) Fluid intake 5 pints per day

+ (β) Sodium citrate

40-60 grs every two hours

Upto 300-400 grs every day

↓ 30 grs four times a day

When urine is alkaline

Compl Hypochloræmia

Treat 1-2 z of common salt in diet

(3) **Urinary antiseptics:**

(a) *Hexamine*

(a) Forms formaldehyde in acid urine

(β) Definitely bactericidal in acid urine

(γ) Preparations (1) Cystopurin

(2) Cystoformin

(3) Cylotropin

(4) Amphotropin

(5) Helmitol

(b) Hexylresorcinol Caprokol

(a) Given in solution with olive oil

(β) Inferior to hexamine

(γ) Acts in both media

(c) Neotropin

(a) Brilliant orange coloured urine

(β) Not a good bactericidal

(d) Pyridium gr 15 tablet T D S

(a) Deep orange coloured urine

(β) Good bactericidal

(e) Acriflavine 0.2 gm. capsules

(a) Bactericidal in alkaline urine only

(β) Bactericidal for B coli and staphylo

(f) *Mercurochrome*

(α) Local irrigator

(β) Intravenous

(g) *Methylene blue*

(α) 14 grs in pill cachet or capsule

(β) Second only to hexamine

(h) *Camphoric acid*

(α) Acts in neutral or alkaline urine

(β) Soothing in cystitis

(i) *Mandelic acid*

Ind Uncomplicated chronic urinary infection

(a) Non operative group

Chronic non obstructive infections

(b) Pre operative group

As a steriliser before operations

(c) Post operative group

Contraind (a) Kidney inefficiency with uræmia

(b) Acute febrile urinary infections

Dose (A) (a) Mandelic acid grs 45

Soda bi carb grs 21

Syrup auranti dr 1

Aqua ounce 1

Ounce one four times a day

+ (b) Ammonium chloride ounce 1

Ext glycyrrhizæ liq drachms 4

Aqua ad ounces 8

One tablespoonful in water four times a day
before food

(B) (a) Ammon chlor mixture (See above)

+ (b) Sodium mandelate ounce 1.5

Syrup auranti ounce 1.5

Aqua ounces 8

One tablespoonful in water four times a day
after food(C) *Ammonium mandelate*

Two drachms in water four times a day

Test 5 c.c. of urine + 5 min of buffered methyl red

If (a) Bright yellow p H 5.3

(b) Orange yellow too alkaline

(j) *Sulphanilamide group*

Ind (1) any reaction

(2) Bactericidal to (a) *Staphylococcus*(β) *B. coli*(γ) *B. pyocyaneus*(4) *Diet*(A) *Acidogenic*

Bread + butter + cheese

, Cereals + sugar + cream

(B) *Alkalogenic* :: (α) Mixed fruit: dates, apples, bananas,
orange, grape fruit

(β) Milk

(γ) Potatoes and onions

(δ) Vegetable soup and green salad

(5) **Urinary lavage** :(α) Anti chemical solutions : soda bi carb
: phosphoric acid

(β) Antiseptic solutions : pot. permanganate

(γ) Styptic solutions : silver nitrate

(6) **Vaccines and sera**(7) **Treatment of etiology** : constipation(IV) **HÆMATURIA** :Etiology : (A) **Urinary** :

(1) Congestion	} of {	(1) Kidney
(2) Inflammation		(2) Pelvis
(3) Ulceration		(3) Ureter
(4) New growth		(4) Bladder
(5) Calculus		(5) Prostate
(6) Trauma		(6) Urethra

(B) **Blood diseases** :

: Purpura, hæmophilia

(C) **Reflex** :

: Appendicitis, salpingitis

Causes . (A) **Painless hæmaturia** :(a) *At the beginning of micturition* :
Urethra growth(b) *At the end of micturition* :
Bladder (α) Growth : papilloma
(β) Stone?
(γ) Prostatic congestion(c) *All throughout the micturition* :
(1) Ureter (α) Growth
(β) Ureterocele
(2) Kidney (α) Growth
(β) Stone
(γ) Tuberculosis
(δ) Polycystic disease
(3) Prerenal : (α) Purpura
(β) Arteriosclerosis(B) **Painful hæmaturia** :(a) *At the beginning of micturition* :
: Urethra . (α) Acute urethritis
(β) Caruncle
(γ) Stone
(δ) Clot — trauma

(b) *At the end of micturition*

- Bladder (a) Acute cystitis
 (β) Calculus
 (γ) Mal gnancy
 (δ) Retention of clots

(c) *All throughout the micturition*

- (1) Ureter (a) Stone
 (β) Blood clot
 (2) Kidney (a) Pyelitis pyelonephritis
 (β) Stone
 (γ) Tuberculosis

(1) **Pronounced hæmaturia**

- (A) Kidney (a) Purpura
 (b) Infarction
 (c) Trauma
 (d) Papilloma or carcinoma
 (e) Hypernephroma
 (B) Bladder (a) Purpura
 (b) Acute hæmorrhagic cystitis
 (c) Papilloma
 (d) Trauma
 (C) Prostate (a) Carcinoma
 (b) Enlarged prostate
 (D) Urethra (a) Growth
 (b) Trauma

(E) Reflex appendicitis

(2) **Slight painful hæmaturia****Urinary stone**

- Site (1) *Kidney*
 (a) Renal colic
 (b) Worm like clots
 (c) Albumin hæmoglobin > 16 1
 (d) Renal casts and epithelium
 (e) Altered blood
 (2) *Ureter*
 (a) Ureteral colic
 (b) Worm like clots
 (3) *Bladder and posterior urethra*
 (a) Only with micturition
 (b) Terminal hæmaturia
 (c) Pain at the penile tip + strangury
 (d) Coffee ground or bright red
 (e) Bladder epithelium
 (4) *Anterior urethra*
 (a) Independent of micturition
 (b) Initial hæmaturia

- (c) **Bright red**
- (d) Pencil clots .

Compl : (1) Renal, ureteral or urethral colic
 (2) Urinary infection
 (3) Urinary calculi
 (4) Anæmia

Treat : (A) **Medical :**

- (a) Morphia :
 . Contraindicated in kidney inefficiency
- (b) Calcium lactate :
 : 15 grs every four hours
- (c) Coagulants
- (d) Blood transfusion

(B) **Local :**

- (a) Cold applications : ice packs
- (b) Hot irrigations :
 : Of bladder, renal pelvis
- (c) Instillations .
 (a) Adrenaline . 1 in 1,000
 (β) Silver nitrate : 1 in 10,000

(C) **Surgical :**

- (a) Nephrectomy :
 Ind : Uncontrolled profuse renal hæmorrhage
- (b) Suprapubic cystostomy .
 Ind . (a) Bladder condition
 (β) Clot retention

(V) **PYURIA :**

Etio : (A) **Pronounced :**

- (1) *Kidney* : (a) **Pyonephrosis**
 (b) Calculus
 (c) Tuberculosis
- (2) *Bladder* : (a) Acute cystitis
 (b) **Diverticulum**
 (c) **Burst appendicular abscess**
- (3) *Prostate* : Burst prostatic abscess
- (4) *Urethra* : (a) Acute urethritis
 (b) Peri urethral abscess

(B) **Slight or microscopical :**

- (a) All kinds of inflammation of all urinary organs
- (b) Reflex congestion from neighbouring inflamm.

Treat : (A) Treatment of etiology

 (B) Excision of the source :

- (a) Nephrectomy
- (b) Diverticulectomy

(C) Drainage :

- (a) Nephrostomy
- (b) Cystostomy

(VI) CRYSTALURIA LITHIASIS**(A) Primary stones. Metabolic stones**

Path Arise from slow precipitation of crystalloids in colloid magma in acid urine

Etio (1) **Geography :**

- (a) England Derbyshire
- (b) Egypt and Palestine
- (c) India. (Rajputana, Cutch, Sind & Kathiawar)
- (d) China

(2) **Heredity :**

In cystin stones

(3) **Diet :**

- (a) Avitaminosis of Vitamins A, B and D
- (b) Faulty diet
- (c) Lack of water

(4) **Errors of metabolism :**

(A) *Calcium metabolism*

- Etio** (a) Hyper parathyroidism
(b) Prolonged immobilisation

- Path** (1) Skeletal decalcification
↓ (2) Raised blood calcium
↓ (3) Raised calcium excretion

- Treat** (a) Hyper parathyroidism
Removal of parathyroid adenoma
(b) Immobilisation
(a) Plenty of fluids
(β) Vitamins A, B and D
(1) Changes of posture
(δ) **Keep the urine acid**

(B) *Oxalate diathesis*

- Etio** (a) Hyperchlorhydria
(b) Faulty diet
Rhubarb spinach, asparagus
(c) Faulty carbohydrate metabolism

- Treat** (1) Diet
(a) Avoid
Milk, eggs, tea, coffee, cocoa,
sugar, rhubarb, paraffin
(b) Take
Meat, fish, bread, rice, butter
(2) Vitamins A, B, D
(3) **Keep the urine acid**
(4) Mag sulph or carb 30 grs daily

(C) *Uric acid diathesis*

- Etio** (a) Defective nucleo protein metabolism
(b) Excessive purine diet meat

Treat (1) Diet

Avoid meat, sugars, starch

(2) **Keep the urine alkaline**

(3) Small doses of mercury.

Calomel 1/10 gr.

(D) *Cystinuria*

Etio Familial inborn metabolic error

Age Children

Path Deficient oxidation of sulphur

Morb anat Flat, colourless, hexagonal crystals

Treat Keep the urine alkaline

(E) *Phosphaturia*.

Etio (a) Dyspepsia

(b) Phosphatic diabetes

(c) Alkaline urine

(a) Urinary infection

↓ (β) Decomposition of urea

↓ (γ) Liberation of ammon carb

↓ (δ) Conversion of normal phosphates
into triple phosphates

Treat (a) **Keep the urine acid**

(b) Treat the urinary infection

(B) **Secondary stones: Local stones**

Path From local inflammation and decomposition of urine

Etio (a) **Urinary infection: Urea splitting organisms**

(α) *Staphylococcus*

(β) *B. pyocyaneus*

(γ) *B. proteus*

(b) **Urinary stasis:**

Obstruction to urinary passages

(c) **Alkaline urine:**

Conversion of healthy phosphates into triple
phosphates by ammonium carb. liberated from
urea by organisms (See above)

(d) **Urinary passage inflammation:**

Provides calcium

(e) **Foreign bodies: External or pathological**

Provide nucleus

Treat (1) Treat the etiology

(2) **Descending drainage**

Plenty of fluids and diuretics

Investigations in urinary lithiasis:

(1) Family history

(2) Personal history.

- (a) Residence
- (b) Diet
- (c) Fluid intake
- (d) Urinary disease crystaluria
- (e) Metabolic disease
- (3) Examination
 - (a) Metabolic disease
 - Parathyroids
 - (b) Urinary obstruction or infection or crystaluria
 - (c) Blood
 - (a) Calcium content
 - (β) Phosphorus content
 - (γ) Urea and uric acid
 - (δ) Creatinine
 - (ι) Sugar
 - (d) *Jean's test for avitaminosis A*
 - (e) Chemical examination of stone passed

General treatment of lithiasis

- (1) **Treat the etiology**
 - (a) Metabolic
 - (b) Urinary
 - (α) Obstruction
 - (β) Irritation
 - (γ) Infection
- (2) **Descending urinary drainage**
Plenty of fluids + diuretics
- (3) **Opposite chemical reaction**
- Method (a) *Acidification*
 - Ind (α) Oxalates
 - (β) Carbonates
 - (γ) Phosphates
 - (b) *Alkalinisation*
 - Ind (α) Urates
 - (β) Cystine
- Tech (a) Oral medication
 - (α) Acid ammon phosphate acidity
 - (β) Pot or sod citras alkalinity
 - (b) Local irrigations
 - 1% phosphoric acid acidity
- (4) **Vitamins A B and D**
- (5) **Diet** (A) Avoid generally
 - Condiments dried fruit and vegetables
spinach raisins almonds figs olives,
parsnips cherries beets carrots cucum
ber celery rhubarb melon pine apple
 - (a) Oxalates Tea coffee sugar, paraffin
 - (b) Uric acid meat sugar, starch
- (B) Take generally
 - Bread, butter, rice fish

(VII) PNEUMATURIA.

- Eto:** (1) Instrumentation
 (2) Vesico intestinal fistula :
 (a) Congenital
 (b) Appendicular abscess
 (c) Tuberculosis
 (d) Regional ileitis
 (e) Diverticulitis
 (f) Carcinoma
 (3) Bacilluria
 (a) Coli bacilli
 (b) Gas producing bacteria

(C) ABNORMAL MICTURITION**(I) FREQUENCY OF MICTURITION****(A) Physiological** More fluid intake, diuretics**(B) Pathological.****(1) Polyuria :**

- (a) **Functional :** Nervous
 (b) **Extra-urinary general diseases :**
 (a) Diabetes
 (β) Tabes dorsalis
 (c) **Kidney inefficiency :**
 (a) Bacterial Pyelitis
 . Pyelonephritis
 . Pyonephrosis
 (β) Non bacterial. **Chronic nephritis**
 : **Hydronephrosis**
 : Mobile kidney
 . Polycystic kidney
 : Growth

(2) Local causes :**(A) Spasmodic bladder :**

- (a) Congenital
 (β) Secondary to chronic cystitis

(B) Bladder irritation :

- (a) **Direct :**
 (1) Vesical calculus
 (2) Ureterocele
 (3) **Altered urine :** High acidity
 . Phosphaturia
 . Oxaluria
 (β) **Reflex :**
 (1) Kidney : Calculus

- (2) Ureter: calculus
- (3) Rectum: **Proctitis**
: Worms
- (C) **Bladder inflammation:**
 - (a) **Non-bacterial:**
 - (1) **Secondary congestion:** Append.
 - (2) Secondary trigonitis: cervicitis
 - (β) **Bacterial:**
 - (1) Primary: B coli; staphylo
 - (2) Secondary:
 - (a) Kidney: Pyelitis
: Pyelonephritis
· Pyonephrosis
 - (b) Bladder. Growth
· Stone
· Internal fistula
 - (c) Prostate. Prostatitis
· Prostatic abscess
: Prostatic calculi
 - (d) Urethra · Urethritis
 - (γ) **Urinary obstruction**
- (D) **Involvement of nerve supply:**
 - (a) Malignancy of bladder and prostate
 - (b) Infiltrating neighbouring growths
- (E) **Pressure from without:**
 - (a) **Pregnancy**
 - (b) Fibroids
 - (c) Ovarian cysts
- (F) **Urinary obstruction:**
 - (a) Internal meatus spasm
fibrosis
 - (b) Prostate; (α) **Enlargement**
(β) Fibrosis
(γ) Carcinoma
 - (c) Urethra: (α) **Stricture**
(β) Calculus
 - (d) **Phimosis and pinhole meatus**
 - (e) **Cystocele and uterine displacements**

Treatment of frequent micturition: Treat the etiology

(II) INCONTINENCE OF URINE.

Def: Loss of voluntary control over micturition

Anat: Nerve mechanism of micturition:

- (A) Afferents from bladder and post. urethra
- (B) Urinary centre: in lumbar segment
- (C) Efferents
 - (1) **Sympathetic: Anti-micturition**

- Course · (a) 1, 2, 3 *lumbar* roots
 ↓ (b) Inferior mesenteric plexus
 ↓ (c) *Presacral nerve*
 ↓ (d) Hypogastric plexus
 ↓ (e) Bladder

- Function · (a) Inhibition of detrusor
 (b) Stimulation of sphincter

(2) **Parasympathetic : Micturition**

- Course (a) 2, 3, 4 *sacral* roots
 ↓ (b) *Nervi erigentes* (Pelvic nerves)
 ↓ (c) Hypogastric plexus
 ↓ (d) Bladder

- Function (a) Contraction of detrusor
 (b) Relaxation of sphincter

Varieties : (A) *False incontinence*

Def : **Distended bladder** with overflow

Etio (1) **Urinary obstruction :**

- (a) Stricture urethra
 (b) Enlarged prostate

(2) **Nerve injury :**

- (a) Early stages of supralumbar spinal
 (b) Lesions of
 (α) Lumbar centre
 (β) Cauda equina
 (γ) Hæmorrhoidal sympathetic plexus

(3) **Nerve disease :**

- . Tabes dorsalis

(B) *True incontinence*

Def **Empty bladder** with involuntary micturition

Varieties · (1) *Passive true incontinence .*

- Path Paralysis of internal sphincter
 Clinic **Continuous dribbling**
 Etio : (a) Difficult labour
 (b) Cystocele
 (c) Rupture urethra
 (d) Perineal prostatectomy
 (e) Nerve diseases

(2) *Active true incontinence .*

- Path : Hyperspasm of detrusor
 Clinic : (a) **Urgency of micturition**
 + (b) Partial loss of control
 Etio : (a) Acute trigonitis or cystitis
 (b) Nerve diseases
 (c) Later stages of supralumbar trauma :
: Automatic bladder

(d) Childhood

(a) Physiological

Upto the end of second year

(β) Reflex

(1) Abnormal urine acidity

(2) Regional proctitis worms

(3) Distant enlarged adenoids

(γ) Essential enuresis

(C) Automatic bladder

(1) Spinal cord injury

↓ (2) False incontinence with overflow

↓ (3) Automatic bladder

Etio (1) **Mechanical** (a) Trauma to the int. sphincter

(α) Parturition

(β) Cystocele

(γ) Perineal operation

(δ) Perineal trauma

↓ (b) Passive true incontinence

(2) **Obstructive** (a) Lower urinary obstruction

(α) Urethral stricture

(β) Enlarged prostate

↓ (b) False incontinence

(3) **Irritative** (a) Multiple sclerosis

or (b) Local irritation

↓ (c) Active true incontinence

(4) **Nerve lesions**(A) *Trauma*

(a) Supralumbar

(α) False incontinence

↓ (β) Automatic bladder

(b) Lumbar or caudal

(α) False incontinence

(β) Partial voluntary control

(B) *Disease*

(a) Tabes dorsalis

False incontinence

(b) Multiple sclerosis

Active true incontinence

(5) **Juvenile enuresis**

Def Incontinence of urine in children above two years

Etio Hereditary familial congenital or acquired

Causes (a) **Lack of proper habit**(b) **Neurosis**

(α) Hypersensitiveness of lumbar centre

(β) Deficient cerebral inhibitory control

- (r) Spinal lesions
 - (1) Spina bifida occulta
 - (2) Tuberculosis

- (c) Adenoids and tonsils -
Asphyxial nervous irritability

- (d) Irritability of bladder ;
 - (1) Local
 - (a) Hyper acid urine
 - (β) Bacilluria
 - (2) Regional
 - (a) Phimosis and balanitis
 - (β) Vulvitis
 - (r) Proctitis and oxyuriasis

- (e) Constitutional defects :
 - (a) Diabetes mellitus and insipidus
 - (β) Anæmia
 - (r) General debility

- (f) Chronic interstitial nephritis

- Clinical types
- (a) Nocturnal
 - (b) Nocturnal + diurnal

Treat Treat the etiology :

- (1) Mechanical
 - (a) Muscular tonics
Strychnine, ergot, cantharides
 - (b) Peri urethral paraffin injections
 - (c) Plastic operations on sphincter
 - (d) Reformation of sphincter (Med Ann 1936)
Transplantation of gracilis
- (2) Nerve trauma and diseases
 - (a) Aseptic catheterisation continuous
 - (a) Urethral
 - (β) Suprapubic
 - (b) Bladder lavages if chronic cystitis
 - (c) Urinary antiseptics + diuretics
- (3) Irritable bladder
 - (a) Hot hip baths or enemata
 - (b) Diuretics and diluents
 - (c) Sedatives and antispasmodics
 - (d) Chemical opponents
 - (a) Acidifiers
 - (β) Alkalizers
- (4) Juvenile enuresis
 - (a) Treat the etiology
 - (a) Phimosis
 - (β) Worms
 - (r) Enlarged tonsils

- (δ) Cerebral or spinal condition
 (u) Habit
- (b) R̄
 Pot citras grs xv
 Pot acetas grs xv
 Tr hyoscyamus m x
 Inf buchu ounce ss
 zii — ziv every four hours
- or (c) R̄
 Pot bromide grs x
 Tr belladonnæ m x
 Inf buchu ounce ss h s
- (d) Sacral epidural injection
 15-55 drachms of sterile saline
- (e) General urinary hygiene
 (α) Passing urine at bed time
 (β) Restriction of fluids before bed time
 (γ) Removal of urinary or rectal irritation
- (f) Psychological treatment
 Praise and encouragement
- (g) Hormone therapy
 Prolan A & B + thyroid extract

(III) RETENTION OF URINE

Def Inability to pass urine, due to

- (a) Urethral obstruction
 (b) Loss of expulsive force of detrusor

Etio (1) *Obstructive causes*

(A) *Bladder*

- (a) Internal
 (α) **Calculus** or foreign body
 (β) Pedunculated growths
 (γ) Blood clot
 (δ) Diverticulum
- (b) External
 (α) **Gravid uterus**
 (β) Uterine fibroids
 (γ) **Retroverted uterus**

(B) *Bladder neck and posterior urethra*

- (a) Congenital sphincter spasm
 (b) Congenital urethral valve
 (c) **Acute posterior urethritis**
 (d) **Calculus, foreign body, blood clot**
 (e) **Prostatic affections**
 (α) Inflammation
 (β) Stone
 (γ) Enlargement
 (δ) Fibrosis
 (u) Tumours

- (f) Involvement in malignancy :
 - (a) Cervix
 - (β) Rectum
- (C) *Anterior urethra* :
 - (a) **Stricture**
 - (b) Peri-urethral abscess or fistula
 - (c) Rupture
 - (d) **Calculus** ; foreign body ; blood clot
 - (e) Growths
 - (f) **Phimosis with pinhole meatus**
 - (g) Priapism
 - (a) Secondary to spinal lesions
 - (β) Reflex
 - (γ) Thrombosis of corpora
- (2) *Non obstructive causes* :
 - (A) **Functional** : Mental ; habit
 - (B) **Congestive** : Prolonged distension
 - (C) **Reflex** :
 - (a) Post operative
 - (β) Neighbouring inflammations
 - (D) **Atonic** :
 - (a) Nerve injuries or diseases
 - (β) Senile
 - (E) **Nervous** :
 - Tabes , myelitis ; spina bifida
 - (F) **Toxic** :
 - (a) Fevers
 - (β) Chemical
 - (γ) Infections

Most common causes of retention :

- (1) *Traumatic* :
 - (A) Rupture urethra
 - (B) Post-operative reflex
 - (C) Spinal injuries
- (2) *Pathological* :
 - (A) *Child* :
 - (a) **Atresia meatus + phimosis**
 - (b) **Vesical or urethral calculus**
 - (B) *Males*
 - (a) Young adult male :
: **Acute gonorrheal urethritis**
 - (b) Middle-aged male :
: **Stricture urethra**
 - (c) Senile male :
: **Enlarged prostate**
 - (C) *Females* :
 - (a) Young adult female :
: **Retroverted gravid uterus**

- (b) Middle aged female
Cystocele
- (c) Senile female
Carcinoma cervix

Clinic (A) Acute :

- (a) Inability to micturate with urgent desire
- + (b) Acute painful distension

(B) Chronic .

- (a) Incontinence + frequency with no desire
- (b) Partial painless distension
- (c) Signs of urinary back pressure

Diff diag (A) Anuria :

- (a) Empty bladder
- (b) Easy passage of catheter
- (c) No urine drawn out
- (d) Signs of uræmia

(B) Rupture bladder

- (a) Empty bladder
- (b) Easy passage of catheter
- (c) Blood stained urine little quantity
- (d) History of trauma

(C) Acute retention :

- (a) Inability to micturate with urgent desire
- (b) Acute painful distension
- (c) Difficult passage of catheter
- (d) Much urine drawn out

(D) Chronic retention .

- (a) Incontinence or frequency with no desire
- (b) Painless distension
- (c) Passage of catheter
 - (a) Easy in non obstructive cases
 - (β) Difficult in obstructive cases

Differential diagnosis of etiology

? (1) *Obstructive*

- (a) Bladder
- (b) Posterior urethra
- (c) Anterior urethra

? (2) *Non obstructive*

- (a) Functional
- (b) Congestive
- (c) Reflex
- (d) Atonic
- (e) Nervous
- (f) Toxic

Treat (A) Acute retention

(1) Conservative :

- (a) Hot bags → enemata → baths

+ (b) Sedatives : morphia, hyoscine

+ (c) Antispasmodics : atropine

↓ (2) **Catheterisation :**

(a) Catheterisation :

(α) Urethral anæsthesia

↓ (β) Passage of catheter :

(1) Rubber

(2) Gum elastic

(3) Metal

(4) Filiform bougies

↓ (b) Gradual decompression .

• 4 ounces an hour

(α) Intermittent

or (β) Continuous

↓ (3) **Suprapubic drainage :**

(a) Suprapubic aspiration

(b) **Suprapubic catheterisation**

(c) Suprapubic cystostomy : contraindicated

(B) *Chronic retention :*

(1) **Drainage :** Gradual decompression

(a) **Urethral :** Catheterisation

Tech (1) Meatal preparation

↓ (2) Urethral anæsthetisation :

• By cocaine bi carbonate

↓ (3) Passage of catheter :

(α) Gum elastic coude No 12

(β) Gum elastic bicoude No 12

↓ (4) Withdrawal of 15 ounces of urine

↓ (5) Tying in the catheter with spigot

↓ (6) Withdrawal of urine .

• 10 ounces every 2 hours

(b) **Suprapubic :** Catheterisation

Tech : (1) 1% novocain infiltration

• Midline symphysis to umbilicus

↓ (2) Suprapubic incision

↓ (3) Dissection of prevesical fat

↓ (4) Introduction of No 28 Malecot

↓ (5) Drainage of Retzius

↓ (6) Anchor catheter to skin

↓ (7) Intravenous glass dripper

or (8) Kidd's U tube

(2) **Treat the underlying etiology**

After-treat : *Treat the urinary sepsis and back pressure :*

(1) **Drainage :** Gradual decompression (See above)

(2) **Urinary antisepsis :**

(a) Chemical opponents

(b) Urinary antiseptics

(c) Local irrigations

(3) Treatment of urinary back pressure failure:

(a) Plenty of fluids

(b) Diuretics

Treatment of etiological varieties of retention.(A) *Acute urethral retention*

(1) Hot bag → enema → bath

+ (2) Sedatives morphia hyoscine bromides

+ (3) Suppository Belladonna ext gr $\frac{1}{2}$ Opium liq ext gr $\frac{1}{2}$

+ (4) Oral medication

(a) Minim dose of ferric chloride every 5 min

(b) Spiritus etheris nitrosi half tea spoon

+ Water half a glass

Every fifteen minutes

↓ (5) Catheterisation

(a) Sterilise the glans

↓ (b) Urethral wash

Pot permang 1 in 5000

↓ (c) Urethral instillation

Novocain 5%

For fifteen minutes

↓ (d) Catheterisation

↓ (e) Pot. permang lavage of bladder

+ (6) Belladonna—opium suppository

(B) *Enlarged prostate retention*

(1) Most rigid aseptic and delicate catheterisation

Gum elastic or metal

↓ (2) Gradual decompression (See above)

+ (3) Urinary mixture every four hours

Hexamine grs v

Liq strychnine m v

Inf buchu ounce i

(C) *Acute organic retention* acute on-chronic(1) Morphia $\frac{1}{2}$ gr + Hot hip bath

↓ (2) Urethral gum elastic catheterisation

Tech (a) Sterilise the catheter

Plunge for 2 min in boiling water

↓ Dip in sterile antiseptic lotion

↓ (b) Urethral preparation

(a) Moist cleansing of glans

(β) Irrigation of ant urethra

↓ (c) Urethral anæsthetisation

Solutions (a) Novocain 4 %

(β) Percain 1 in 1500

(γ) Decicain 2 %

Quantity Two drachms

Time Five minutes

↓ (d) Sterile catheterisation

(a) Enlarged prostate

- (1) Large bicoide gum elastic
- + (2) Rectal guiding finger
- (3) Urethral stricture
 - (1) Olivary catheter
 - (2) Phillip s screwing catheter
 - (3) Gum elastic bougie faggot
- ↓ (e) Tying in the catheter
- ↓ (f) Gradual decompression
 - (a) Intravenous saline dripper
40 60 drops per minute
 - or (β) Withdrawal of urine
10 ounces every two hours
- ↓ (3) Suprapubic catheterisation (See above)
- or (4) Suprapubic puncture
By smallest lumbar puncture needle
- (D) *Retention with overflow*
 - (1) Controlled decompression Saline dripper
 - (a) Urethral
 - (b) Suprapubic
 - + (2) Continuous intravenous sod sulphate
- (E) *Calculus retention very painful*
 - (1) *Calculus in fossa navicularis*
Meatotomy → extraction
 - (2) *Calculus in penile urethra*
 - (a) Bivona s device Urine wash
 - (α) Local anæsthesia
 - ↓ (β) Compress the penile tip
 - ↓ (γ) Pass urine
 - ↓ (δ) Let go
 - ↓ (b) External urethrotomy → extraction
 - (3) *Calculus in posterior urethra*
 - (a) Spinal anæsthesia
 - ↓ (b) Urethral catheterisation
 - ↓ (c) Dislodge the stone into bladder
 - ↓ (d) Suprapubic lithotomy
- (F) *Acute clot retention*
 - (1) Catheterisation → lavage
 - (a) Relief of retention
 - ↓ (b) Bladder irrigation
 - or (2) Suprapubic cystostomy → lavage
- (G) *Paralytic or cord bladder*
 - (1) Suprapubic catheterisation
 - ↓ (2) Gradual continuous decompression
 - (a) Intravenous dripper method
 - + (b) Closed sterile bottle drain

(IV) MICTURITION IN NERVOUS AFFECTIONS

- Clinic (1) Pain (a) Continuous
(b) Crises

- (2) Difficult micturition
- (3) Complete retention
- (4) Incontinence
 - (a) False retention with overflow
 - (b) True active incontinence
 - (α) Active detrusor spasm
 - (β) Passive sphincter paresis
 - (c) Automatic bladder reflex micturition
- (5) Urgency or absence of desire
- (6) Signs (a) Collapsed bladder
or (b) Distended bladder
- Etio** (A) Brain abnormalities
- (B) Spinal abnormalities cord bladder
- (C) Sympathetic and parasympathetic unbalance
- Path** (A) Irritative or spastic bladder
- (B) Paralytic bladder
- Path anat** (A) "
- (B) Atonic bladder
 - (a) Thin paralysed detrusor
 - (b) Big capacity
- Compl** (1) Cystitis
- (2) Trabeculations
- (3) Phosphatic incrustations and calculi
- (4) Diverticuli
- (5) Back pressure syndrome
- (6) Urinary sepsis syndrome
- Treat** (1) **Urinary drainage**
 - (a) Intermittent catheter
 - or (b) Permanent indwelling catheter
 - or (c) Suprapubic catheter
- (2) Prevention and treatment of cystitis
 - (a) Chemical opponents
 - (b) Urinary antiseptics
 - (c) Urinary diluents
 - (d) Bladder lavage
- (3) Treatment of atony or spasticity
 - Muscle tonics or antispasmodics

IMPORTANT POINTS

- (1) Chief causes of anuria
 - (a) Post operative renal failure
 - (b) Ascending urinary infection
 - (c) Calculus impaction.

- (2) *Hæmaturia*
 (a) Mild but painful stone
 (b) Profuse but painless growth
- (3) *Pyuria*
 (a) *Pyonephrosis*
 (b) Infected vesicular diverticulum
 (c) Ruptured abscess
- (4) *Incontinence of urine*
 (A) *False*
 Path Retention with overflow
 Clinic Bladder full
 (B) *True*
 Path (a) Active spastic detrusor
 (b) Passive paralytic sphincter
 Clinic (a) Active bladder partially full
 (b) Passive bladder empty
 (C) *Automatic bladder*
 Path Reflex micturition
 Clinic Automatic evacuation of bladder
- (5) *Causes of acute retention*
 (a) Child (a) *Phimosis*
 (b) Stone
 (b) Young adult male gonorrhoeal urethritis
 (c) Middle aged male stricture
 (d) Old aged male enlarged prostate
 (e) Young female gravid uterus
 (f) Middle aged female cystocele
 (g) Old female carcinoma cervix
- (6) *Incontinence of urine is common in*
 (a) Multiparous women with difficult labour
 (a) Sphincteral trauma
 (b) Cystocele
 (b) Young children nocturnal enuresis
 (c) Old males with enlarged prostate
 (d) Spinal injuries.
- (7) *Acute retention of urine*
 (a) Try conservative methods first
 ↓(b) Gradual decompression 4 ounces per hour
- (8) *Complications of retention urine*
 (a) Ascending infection
 (b) Back pressure syndrome
 (c) Reflex anuria on sudden decompression
 (d) *Hæmaturia*
 (e) *Calculus*
- (9) *Causes of frequency of micturition*
 (a) *Polyuria* (a) *Diabetes*
 (b) *Nephritis*

- (b) Irritation of bladder : (α) Local irritation
(β) Neighbouring irritation
- (c) Incontinence
- (d) Chronic retention
- (e) Nervous
- (10) *In every case of urinary instrumentation or operation :*
- (a) *Assess the back pressure syndrome*
- (b) *Assess the urinary infection*
- (c) *Assess the etiology of obstruction*
- (1) *Give diuretics and diluents*
- (2) *Give urinary antiseptics*
- (3) *Use urethral anaesthesia*
- (11) *Treatment of retention of urine :*
- (A) *Drainage of the bladder :*
- Site (a) Urethral
- (b) Suprapubic
- Method (a) Intermittent
- (b) Constant
- Time : (a) Temporary
- (b) Permanent
- (B) *Treatment of back pressure syndrome :*
- (a) Prophylactic
- (b) Curative
- (C) *Treatment of urinary sepsis .*
- (a) Prophylactic
- (b) Curative
- (α) General antiseptics
- (β) Local irrigations
- (D) *Treatment of etiology :*
- (a) Obstruction
- (b) Irritation
- (c) Nervous
- (d) Toxic.
- (12) *Never use mercury oxycyanide solution for bladder lavage in cases of pyelography as mercury iodide formed by its contact with sodium iodide is extremely irritating to the bladder.*
- (13) *Intravenous pyelography is easy, can be done when instrumental one is impossible or inadvisable, is always bilateral and assesses the renal function at the same time, giving an idea of anatomical and physiological states of both the kidneys simultaneously.*
- (14) *I the intravenous ice of the dye function.*

- (15) *Essentials in the treatment of acute and chronic retention*
- Urethral anæsthesia*
 - Gentle instrumentation*
 - Rigid asepsis*
 - Gradual decompression*
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- (11) *Treatment of retention of urine*

- (A) *Drainage of the bladder*

- | Site | (a) Urethral | (b) Suprapubic |
|------|--------------|----------------|
| 1 | 100 | 100 |
| 2 | 100 | 100 |
| 3 | 100 | 100 |
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| 5 | 100 | 100 |
| 6 | 100 | 100 |
| 7 | 100 | 100 |
| 8 | 100 | 100 |
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| 97 | 100 | 100 |
| 98 | 100 | 100 |
| 99 | 100 | 100 |
| 100 | 100 | 100 |

- | Method | (a) | (b) |
|--------------|-----|-----|
| Intermittent | | |
| Constant | | |

- | | | |
|------|-----|-----------|
| Time | (a) | Temporary |
| | (b) | Permanent |

- (B) *Treatment of back pressure syndrome*

- (a) Prophylactic
(b) Curative

- (C) *Treatment of urinary sepsis*

- (a) Prophylactic
- (b) Curative
- (a) General antiseptics
- (b) Local irrigations

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- (12) *Never use mercury oxycyanide solution for bladder lavage in cases of pyelography as mercury iodide formed by its contact with sodium iodide is extremely irritating to the bladder*

- (13) Intravenous pyelography is easy, can be done when instrumental one is impossible or inadvisable is always bilateral and assesses the renal function at the same time giving an idea of anatomical and physiological states of both the kidneys simultaneously

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| | (b) | Suprapubic |

- | Method | (a) | (b) |
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Origin	Site	Time
Vesical	Hypogastric	Independent of micturition
Trigonal	Penile tip	At the end of micturition
Urethral	Local	During micturition
Prostate	Perineum Sacrum	Independent of micturition

- (25) Five main variations in the character of micturition :
- (A) Altered stream :
: Urethral or bladder neck obstruction
 - (B) Altered force of projection .
: Meatal, urethral or bladder neck obstruction
 - (C) Difficulty
(α) Requiring straining * urethral stricture
(β) Worse on straining * enlarged prostate
 - (D) Intermittent flow
(α) Calculus
(β) Diverticulum
 - (E) Forked stream
- (26) *Opium* is indicated in surgical renal hæmaturia. It should be avoided in renal inefficiency lest it should cause suppression of urine
- (27) Alkalisng method of treatment is a safe and satisfactory method in acute febrile types of urinary infection.
- (28) Three groups of urinary antiseptics
- (A) Substances liberating formaldehyde :
: Hexamine with acid ammon phosphate
 - (B) Substances liberating hydroxyacids *
: Ketogenic diet , mandelic acid
 - (C) Substances of sulphonamide group :
: Prontosil, soluseptasine
- (29) Indications in urinary sepsis .
- (A) Mandelic acid indicated in .
(α) Chronic sepsis
(β) Pure *B. coli* infection
(γ) Good renal function
 - (B) Sulphonamide group indicated in :
(α) Mixed infections
(β) Hæmolytic strepto. + *B. proteus*.

- (30) *B coli* is easily killed by
 (a) Sulphonamides
 or (b) Mandelic acid
- (31) Dosage with all mandelic acid preparations must be equal to
3 gms of mandelic acid 4 times a day after meals
- (32) Sulphonamide group is extremely valuable in urinary infections. It is effective in both acid and alkaline urine.
- (33) Think of the possibility of hyper parathyroidism in every case of urinary stone multiple or bilateral urinary stones are present in over 80% of cases of parathyroid tumour, there is elevation of blood calcium
- (34) Acetylcholine is very useful in post oper retention of urine
- (35) *Acid ammonium phosphate is a better acidifier of urine than acid sodium phosphate*
- (36) *Best urine antiseptics*
 (A) Hexamine
 (B) Methylene blue
 (C) Ammonium mandelate
 (D) Sulphonamide
- (37) Mandelic acid and its derivatives have no place in the treatment of acute pyelitis where alkali treatment is the best.
- (38) Alkalies though relieving general symptoms, rarely if ever cure the urinary infection
- (39) Most satisfactory results of mandelic acid therapy have been in cases of long standing urinary infections.
- (40) Presence of any obstruction to the outflow of urine and consequent stagnation makes the sterilisation of urinary tract very difficult.
- (41) Frequency of micturition in young adults with sterile acid urine containing pus
 ? Renal tuberculosis.
- (42) Frequency of micturition more marked during the day
 ? Uncomplicated bladder stone.
- (43) *Most common causes of frequent micturition*
 (A) Polyuria diabetes nervous
 (B) Irritation and spasm of the bladder
 (C) Incomplete evacuation of the bladder
- (44) Normal micturition depends upon
 (a) Patent urethra
 (b) Contraction of detrusor
 (c) Relaxation of sphincter
- (45) *Incontinence is normal upto the end of the first year, continence is fully established by day and night at the end of second year, incontinence beyond the end of the third year is definitely morbid*

- (46) *Enlargement of prostate and stricture of urethra together account for about 90% of acute urinary retentions*
- (47) *Three fundamental principles in the treatment of acute urinary retention*
- Avoid infection*
 - Avoid urethral laceration*
 - Avoid repeated catheterisation*
- (48) *No portion of the catheter which enters the patient's urethra need and should be touched by hand*
- (49) *Longer the retention of urine, slower should be the rate of emptying*
- (50) *If after a reasonable attempt with catheters, the bladder is not entered two courses are open*
- Suprapubic puncture*
 - Suprapubic catheterisation*
- (51) *Repeated suprapubic punctures for acute retention are dangerous as leakage is liable to occur in the cave of Retzius.*
- (52) *Controlled gradual decompression of the bladder is of utmost importance in cases of retention with overflow*
- (53) *Uræmia*
- Acute*
 - Somnolence \rightarrow stupor*
 - Nausea*
 - Headache*
 - Progressive weakness*
 - Chronic*
 - Cerebral*
 - Headache*
 - Restlessness, insomnia*
 - Delusions*
 - Stupor \rightarrow coma*
 - Respiratory*
Dyspnoea
 - Gastro Intestinal*
 - Anorexia*
 - Nausea \rightarrow vomiting*
 - Constipation \times diarrhoea*
 - Flatulence*
- (54) *Non opaque stones*
5% of all urinary stones are non opaque to X Rays They can be displayed by
- Instrumental pyelography*
Filling defect
 - Excretion pyelography*
Persistent shadow at one point
 - Arrest of the medium*
 - Staining by the medium*

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- (55) *Repeated intermittent catheterisation should be avoided, but suprapubic catheter should be inserted at the very commencement of spinal bladder paralysis*
- (56) The first step in a case of nocturnal enuresis is a complete examination of the urinary tract and a radiograph to exclude spina bifida.
- (57) Congenital syphilis plays a very important role in the pathogenesis of enuresis both in childhood and later life
- (58) Half an ounce of a 1-15 solution of liq potash acetat by mouth, repeated every half an hour for eight doses, is exceptionally effective in post operative retention of urine (Med Ann 1934)
- (59) Acute post operative retention never occurs before puberty
- (60) *Proctoclysis favours retention of urine, and removal of rectal tube many a time helps in overcoming the difficulty*

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CHAPTER II

THE KIDNEYS

(I) CONGENITAL MALFORMATIONS.

(1) SOLITARY KIDNEY

- Etio** 1% of post mortem findings?
Clinic (a) No symptoms
(b) Cystoscopy one ureteric orifice
Compl Uræmia after inadvertent removal
Treat Make sure of the other functioning kidney before every nephrectomy

(2) ATROPHIC KIDNEY

- Path** One kidney functionless
Contralateral kidney larger
Clinic Cystoscopy both ureteric orifices present

(3) DOUBLE KIDNEY

- (a) Double Kidneys
(b) Double pelves
(c) Double ureters

(4) ECTOPIC KIDNEY

- Sites** (a) Pelvic kidney
Lateral to rectum (personal case)
(b) Promontoric kidney
(c) Iliac kidney
Clinic Firm round swelling
In any of the above sites
Compl Inflammation
Diff diag Any abdominal tumour or abscess
(5) HORSE SHOE KIDNEY

- Etio** 1 in 700 bodies
Males females 8 3

- Clinic** (a) Epigastric or umbilical pain
(b) Chronic constipation
(c) Recurrent pyelitis
(d) Roaring
Pain on extension of trunk
(e) Supra-umbilical swelling
In front of vertebrae

- X Ray** Pyelography Pelves abnormally low
One of the calyces turned inwards

- Compl** (a) Kinking of ureter
(a) Urinary stasis hydronephrosis
(β) Urinary infection pyelitis
(γ) Urinary calculus
(b) New growth
(c) Difficulty in diagnosis

Treat (1) Extraperitoneal division of isthmus

↓ (2) Nephropexy

(6) POLYCYSTIC KIDNEY

Etio (a) Age (α) Infants

(β) Adults About 40

(b) Sex females

(c) Incidence (α) Familial

(β) Hereditary

Cause Theories

(A) Congenital Developmental

Failure of union between

(α) Excretory canals (Wolffian)

& (β) Convoluted tubules (Metanephros)

(B) Inflammatory nephritis

(C) New formation

Path Multiple translucent cysts

Associated or not with similar condition of other solid viscera e.g. liver and pancreas

Clinic (A) Infant

(a) Enormous swelling

↓ Difficult labour

(b) Anuria → uræmia

(B) Child

(a) Bilateral multilocular swellings

+ (b) Urinary insufficiency

(C) Adult 35-45

(a) *Insidious*

Knobby kidney on routine exam

(b) *Uræmia*

Insidious renal insufficiency

(c) *Tumour*

Multilocular renal tumour

(d) *Infection*

Pyelitis with urinary sepsis

(e) *Hæmaturia*

Painless intermittent

Sign Pyelogram

(a) Kidney inefficiency

(b) Encroachment on pelvis

(c) Narrow and lengthened calyces

(d) Ureter deviated to mid line

Compl (1) Kidney failure

(2) Infection

(3) Ptosis and abnormal mobility

(4) Rupture of the cysts

(5) Hæmaturia

(6) Associated condition of other organs

Treat Rovsing's operation (Personal case)

Ind Pain hæmaturia, infection

- Tech. (a) Exposure
 ↓ (b) Incision of the cysts
 ↓ (c) Drainage

(7) MOVABLE KIDNEY :

- Etio :** (a) Age 25-30
 (b) Sex : Females
 (c) Side : Right

- Causes :** (1) Congenital
 (2) Peri renal atrophy
 (3) Visceroptosis
 (4) Kidney tumour
 (5) Weak abdominal wall

- Varieties :** (A) **Palpable kidney :**
 Lower half felt on deep inspiration
 (B) **Mobile kidney :**
 (a) Upper pole felt on deep inspiration
 (b) Replacement preventable
 (C) **Floating kidney :**
 (a) Freely mobile
 (b) Crosses the mid line

- Path. Range of mobility :**
 . Arc of a circle whose radius is renal pedicle

- Clinic. (A) Local :**
 (1) Pain and discomfort
 (2) Undue mobility
 (3) Lack of normal resistance in loin
 (B) **Referred :** due to drag
 (1) Pyloric obstruction
 (2) Biliary obstruction
 (3) Colic obstruction
 (C) **Nervous.** neurasthenia
 (D) **Associated :** visceroptosis

- Clinic. types :** (1) **Symptomless :** Latent
 : Accidental find in routine exam.
 (2) **Tumour :**
 : Mobile, tender, palpable kidney
 (3) **Painful :**
 (a) Local tension + motion
 (b) Crises :
 (α) Acute pyloric obstruction
 (β) Acute ureteric obstruction
 (γ) Acute pedicle torsion
 (4) **Complication :**
 (a) Obstruction : (α) Hydronephrosis
 (β) Uræmia

(b) Sepsis urinary sepsis

(c) Torsion hæmaturia

Sign : **Pyelogram : In different positions**

(a) Descending

(b) Ascending

Diagnosis (a) Exaggeration of symptoms by exertion

(b) Relief from symptoms by rest

(c) Palpable lump

Diff diag (A) **Any intra abdominal tumour :**

(1) Gastro duodenal

(2) Colic

(3) Gall bladder

(4) Ovarian

(5) Omentum or mesentery

(B) **Abdominal colics :**

(1) Intestinal

(2) Biliary

(3) Urinary

Compl. (1) **Obstruction :**

(a) Urinary (a) Hydronephrosis

(β) Renal insufficiency

(b) Vascular (a) Hæmaturia

(β) Suppression

(2) **Infection**(3) **Crises :**

Clinic (a) History of exertion

(b) Lumbar pain + vomit + rising pulse

(c) Rigidity + tenderness + tumour

(d) Slight temperature

Diff diag **Acute abdomen :**

(a) Ureteric colic

(b) Acute appendicitis

(c) Acute cholecystitis

(d) Perforated peptic ulcer

(e) Twisted ovarian cyst

(4) **Neurasthenia**Treat (A) **Expectant :**

(1) Symptomless type

Do not mention to the patient

(2) Complicated type.

Treat the complications

(B) **Palliative :**

(1) Kidney supports

(2) Abdominal exercises

(3) Rest + tonics + diet

(C) **Operative :**

Ind, (a) Failure of palliative measures

(b) Presence of complications

	(c)	Laborious occupation
	(d)	Relief by rest
	(e)	Neurasthenia not pronounced
Contra ind	(a)	Latency of symptoms
	(b)	Non relief by rest
	(c)	Pronounced neurasthenia
	(d)	Pronounced visceroptosis
Tech	(1)	Thomson Walker
	(a)	Decapsulation
	+ (β)	Suture to quad lumb
	(2)	Sling method
	(a)	Decapsulation
	+ (β)	Fascia lata sling
	(3)	Edebohls
		Fibrous capsule flaps
	(4)	Gruze pack method
	(5)	Peritoneal shelf method
(8) ABERRANT RENAL VESSELS		
Etio	(a) Age	(a) Early life
		(β) Between 30 and 40
	(b)	Sex female
	(c)	Side right
Varieties	(1)	Two independent arteries
		Early childhood syndrome
	(2)	Early division of renal artery
	(3)	Scissor grip
	(4)	Inferior branch obstruction
Clinic	Hydronephrosis with urinary obstruction	
Diff diag	Ureteral kink obstruction	
Compl	Urinary obstruction with its complications	
Treat	(A)	Vein cut
	(B)	Artery
	(a)	Small cut
	(b)	Large re implantation of ureter

(II) RENAL TRAUMA

(1) RENAL INJURIES

Etio	(a)	Run overs
	(b)	Stab wounds
Path	(1)	Subcutaneous
	(a)	Contusion
	(b)	Rupture
	(2)	Penetrating
		Stab wounds
Clinic	(1)	History
	(2)	Shock + nausea with vomit

- (3) **Hæmaturia :** (a) Primary
(b) Reactionary
(c) Secondary
- (4) Perirenal hæmatoma (or wound)
Tenderness + rigidity + swelling
- (5) Meteorism
- Compl (a) Hæmaturia
Pronounced & persistent
May be absent complete avulsion
complete laceration
ureteral blockage
- (b) Dysuria
- (c) Anuria
- (d) Urinary sepsis
(a) Extravasation of urine
(β) Perinephric abscess
- (e) Associated injuries
(a) Intestinal trauma
(β) Intraperitoneal hæmorrhage
- Diagnosis (In mild &/or persistent hæmaturia) cystoscopy
- Treat (A) **Conservo-observative :**
(1) Morphia + anti shock
(2) Local ice bag
(3) Blood coagulants
(4) Urinary antiseptics
(5) Observation
(a) *Half hourly pulse rate*
(b) *Every urine specimen*
- (B) **Operative**
- Ind (1) Associated intraperitoneal lesion
(2) Rising pulse rate
(3) Pronounced persistent hæmaturia
(4) Extravasation of urine
(5) Infection
(6) Secondary hæmorrhage
- Tech (1) **Exploration :**
(a) Lumbar
(b) Abdominal
Ind Suspected intraperit lesion
Tech (a) Small peritoneal incision
(β) Treat abdominal lesion
↓ (γ) Do lumbar exposure
- (2) **Treatment of trauma :**
(a) **Sutures :** Over muscle strip
or (b) Packing
or (c) Drainage
or (d) **Nephrectomy :**

- Ind (1) *Torn renal pedicle*
 (2) *Severe renal laceration*
 (3) *Unsuturable rent*
 (4) *Extensive pelvic rupture*
 (5) *Avulsion of ureter*
 (6) *Uncontrollable hæmorrhage*
 (7) *Diseased kidney*

(2) PERI RENAL HÆMATOMA

(A) Traumatic :

- Treat (1) *Expectant rest + ice + coagulants*
 ↓ (2) *Exploration → drainage*
 (a) *Anterior extraperitoneal route ·*
 Grid iron
 (b) *Posterior or lumbar route*

(B) Spontaneous

- Causes (a) *Renal aneurysm*
 (b) *Renal growths*
 Clinic (1) *Abdominal pain*
 (2) *Signs of internal hæmorrhage*
 (3) *Lumbar swelling*
 Treat *Nephrectomy*

(III) RENAL OBSTRUCTION :

(1) ANURIA (See page 1585)

Def *Total suppression of urine*

Cause *Acute and complete bilateral urinary obstruction*

Etio (A) *Pre-renal ·*

Circulatory shock

(B) *Renal ·*

Destruction or removal

(C) *Post renal ·*

(a) *Obstructive*

(α) *Bilateral cancer cervix*

(β) *Unilateral functioning stone*

(γ) *Reno renal reflex stone*

(b) *Sudden complete relief of obstruction*

Acute urinary retention

(D) *Toxic ·*

(a) *Hæmatogenous*

(b) *Ascending urinary*

Clinic (A) *Initial stage ·*

(1) *History*

(a) *Urine not passed for some time*

(b) *Catheter not yielding any urine*

(2) *Collapsed bladder*

(3) *No urine on catheterisation*

- (B) **Tolerance stage :** One week
: No general symptoms + anuria
- (C) **Uræmic stage :**
- (a) **Early stage :**
: Headache + dry tongue + meteorism
 - (β) **Late stage :**
: Uræmic convulsions and coma

- Diagnosis :** (1) **Of anuria :**
: From retention
- (2) **Of the cause of anuria :**
- (a) Toxic
 - (b) Infective
 - (c) Obstructive
 - (d) Reflex
- (3) **Of the side affected :**
- (a) Side of recent pain
 - (b) Side of tender rigidity
 - (c) X-Ray

Treat : (See page 1587)

(2) **HYDRONEPHROSIS :**

Def : Dilatation of kidney pelvis and calyces accompanied by absorption of renal parenchyma, due to chronic aseptic retention of urine in the kidney and the renal pelvis, caused by chronic intermittent-but-complete or constant-but-incomplete obstruction in the ureter or urethra

Etio : (1) **Unilateral hydronephrosis :**

(A) **Ureteral obstruction :**

- (a) **Lumen :** (1) *Calculi*
(2) F.B.; blood clot
(3) Tumour
- (b) **Wall :** valves, folds, strictures
- (c) **External .**
 - (1) Tumours
 - (2) Bands and adhesions
 - (3) Perinephric abscesses
 - (4) *Aberrant vessels*

(B) **Renal pedicle obstruction :**

- (a) **Kinking**
 - (1) Mobile kidney
 - (2) Genital kidney :
 - (α) Chronic genital infection
 - ↓ (β) Upward lymph spread
 - ↓ (γ) Atonic ureter and pelvis
 - ↓ (δ) Pelvi ureteral kink
- (b) **Torsion pedicle :**
: Mobile kidney

(C) **Idiopathic** •

Neuro muscular inco ordination

(2) **Bilateral hydronephrosis :****Causes Urethral obstruction :**(a) *Congenital*

(1) Pin point meatus

(2) *Valve or fold* (in posterior urethra)(b) *Acquired*

(1) Stricture

(2) Enlarged prostate

(3) Pelvic tumour

Varieties (1) *Etiological*(A) **Congenital hydronephrosis**(B) **Obstructive hydronephrosis**(C) **Idiopathic hydronephrosis**

Small painful hydronephrosis

(2) *Causative*(A) **Calculus :** (Obstructive)(B) **Traumatic**(C) **Mobile :** (kink or torsion)(3) *Clinical*

(A) Closed or constant

(B) Open or intermittent

(C) Unilateral, bilateral

(4) *Anatomical*(A) **Pelvic .**

Etio Upper urinary tract obstruction

(B) **Renal .**

Etio Lower urinary tract obstruction

Clinic (1) Renal signs • Tumour with tension pain(A) Closed hydronephrosis **Constant**

(B) Open hydronephrosis

(a) Intermittent renal colic

↓ (b) { (α) Oliguria

(β) Painful renal swelling

(c) { (α) Polyuria

(β) Disappearance of renal tumor

Pain + tumor ∝ inversely with urine(C) **Idiopathic hydronephrosis****Position-relief syndrome**(2) **General signs Urinary toxæmia**

Uræmia (in bilateral cases)

(3) **Special signs :**

(1) Blood urea

(2) Plain X Ray

(3) Excretion pyelography

- (4) Cystoscopy :
 (a) Simple
 (b) Chromo cystoscopy
 (c) Ureteral catheterisation :
 : Estimation of pelvic capacity
 (d) Ascending pyelography

Compl: (1) Anuria \rightarrow uræmia
 (2) Sepsis : Pyelonephritis \rightarrow pyonephrosis
 (3) Calculi
 (4) Rupture

Treat: (A) *Removal of the cause :*

- (1) Dilatation of stricture urethra
 (2) Removal of prostatic obstruction
 (3) Treatment of ureteral conditions :
 (a) Pinhole orifice
 (b) Impacted stone
 (c) Kink, valve or fold
 (4) Fixation of mobile kidney

(B) *Local treatment :*

(1) **Conservative :**

Ind. Mild unilateral or bilateral

- Tech (a) Removal of cause
 (b) Periodical observations :
 (a) Pyelograms
 (b) Renal function tests
 (c) Clinical symptoms

(2) **Nephrectomy :**

- Ind : (a) Large and thin-walled sac
 (b) Sepsis
 (c) Stone
 + (d) Other kidney . healthy

(3) **Plastic + temporary nephrostomy :**

- Ind (a) No infection
 (b) No distal obstruction
 (c) Functioning kidney
 Tech (a) Pyeloplasty
 (b) Pyeloplication . Israel
 (c) Triangular resection :
 . Thomson Walker
 (d) Orthopædic resection :
 . Albarran
 (e) Excision of the sac :
 : Von Lichtenberg

(4) **Palliative :**

- Tech. (a) Renal decapsulation
 (b) Ureteric transplantation

(5) **Renal sympathectomy :**

Ind : Idiopathic hydronephrosis

(IV) RENAL SEPSIS:Etio Age **Children**Sex **Pregnant women**Predisp: (a) **Lower genito urinary sepsis**(b) **Constipation**(c) **Acute illness**Site **Right kidney**Path (1) **Routes of infection**(A) **Descending:** Hematogenous
Septicæmic, pyæmic(B) **Ascending:**
Ascending lower urinary sepsis(C) **Obstruction with stasis:**
Urinary passage obstruction(D) **Irritation:**
Stone excretion of irritants(E) **Migration:**
(a) *B coli* from intestines
(b) Septic cervix(2) **Pathological groups**(A) **Cavity:**(a) **Pyelitis**(b) **Pyelonephritis**(c) **Pyonephrosis**(B) **Substance:**(a) **Renal abscess**(b) **Renal carbuncle**(C) **Exterior:**(a) **Perinephritis**(b) **Perinephric abscess**(a) **Primary local cause**(β) **Secondary to**(1) **Kidney sepsis**(2) **Neighbouring sepsis**(3) **Pyæmia**Bacterio (1) ***B coli***(2) ***Pyococci* staphylo, strepto**

Clinic. varieties.

(1) **Fulminating:** General + + + , local +(2) **Acute** : General + + , local + +(3) **Subacute** : General + , local +(4) **Chronic** : General — , local +(5) **Recurrent** : General and local exacerbationsClinic: (1) **General**(a) **Septic toxæmia**(b) **Uræmia**(2) **Local**. **Pain + tenderness + rigidity + swelling**

- (3) *Urinary* :
 (a) Bacill-hæmat-py-uria
 (b) Olig an-uria
 (c) **Micturition** :
 : Frequency, dysuria, strangury
- (4) *Etiological* :
 : **Signs and symptoms of causative factor** :
 (a) Urinary
 (b) Genital
 (c) Intestinal
 (d) Hæmatogenous : furunculosis etc.

Signs : (1) Cystoscopy
 (2) Ureteral catheterisation
 (3) Pyelography . (a) Descending
 (b) Ascending
 (4) Microscopical and cultural exam. of urine

Diff diag . (1) **General sepsis and pyrexias** :

- (a) Malaria
 (b) Typhoid
 (c) Septicæmia
 (d) Pyæmia

(2) **Causes of uræmia** :

- (a) Reflex
 (b) Obstructive

(3) **Renal diseases** :

- (a) Simple urinary obstruction
 (b) Renal growths
 (c) Mobile kidney

(4) **Regional inflammations** :

- (a) Acute appendicitis
 (b) Acute ureteral colic
 (c) Acute cholecystitis
 (d) Acute basal empyema

Diff. diag. : *Of the etiology of renal sepsis* :

- (1) Hæmatogenous . furunculosis
 (2) Obstructive . enlarged prostate
 (3) Irritative . renal calculus
 (4) Migrating : constipation
 (5) Ascending . urethritis

Compl : (1) Exacerbations
 (2) Persistent cystitis
 (3) Secondary calculus
 (4) Anuria → uræmia
 (5) Septicæmia

Treat . (1) *Conservative* :

- (A) **Urinary sepsis** :
 (a) Diuretics and diluents

- (b) Urinary antiseptics
 - (α) Hexamine
 - (β) Cystamin
 - (γ) Helmitol
 - (δ) Cystopurin
- (c) Chemical treatment
 - (α) Acid urine
 - R Pot citris gr 60
 - Syr auranti qs
 - Aqua add ounce ½
 - To be taken every 4 hours
 - (β) Alkaline urine
 - R Acid ammon phosph gr xx
 - Syr limonis drachm ½
 - Aqua add ounce 1
 - T D S
- (d) Intravenous dyes
 - (α) Mercurochrome
 - (β) Gentian violet
- (e) Mandelic acid treatment
- (f) Vaccines
- (B) Anuria → uræmia
 - Intravenous (α) Glucose
 - (b) Sod sulphate (42.85 grams per litre)
 - (c) Saline
- (C) General sepsis Chemotherapy
 - Sulphonamide group
 - (α) Sulphanilamide
 - (b) M & B 693
 - (c) Prontosil
 - (d) Soluseptasine
- (D) Local treatment
 - (α) Hot hip baths or fomentations
 - (b) Cupping
- (II) *Operative*
 - (1) Urethral drainage
 - Self retaining catheter
 - (2) Ureteral drainage Ureteral catheter
 - (3) Suprapubic cystostomy
 - (4) Nephrostomy
 - (5) Nephrectomy

Individual conditions in renal sepsis

(A) PYELITIS

Def Inflammation of renal pelvis

Etio (a) Children

(b) Pregnant women

- Clinic (a) Painful tender loins
 (b) Symptoms of cystitis
 (c) Urine examination
 (d) Septic toxæmia temp +
- Signs (1) Cystoscopy
 Ureteral opening changes
 (2) Ureteral catheterisation
 Urine from affected pelvis
 (3) Intravenous urography
 Faint shadow
 (4) Ascending urography
- Treat (1) *Removal of etiology*
 Lower urinary focus
 Renal focus
 (2) *Pyelitis itself*
 (A) *Acute pyelitis*
 (a) *Severe onset*
 (1) Pituitrin $\frac{1}{2}$ — 1 c.c
 For pain
 (2) Fluids
 Glass of fluid
 Every half hour to one hour
 (3) Alkalies
 Pot citras mixture
 Every two hours
 (4) Sulphonamide
 Gms 3 daily
 ↓ (b) *Non amelioration after 36 hours*
 (1) Treatment under (a)
 + (2) Intravenous urotropin
 5 c cs of 40% sol daily
 + (3) Indwelling ureteric catheter
 Pelvic lavage every 4 hours
 ↓ (4) Nephrostomy
 Ind Ultra acute oliguric cases
 + (5) Intravenous sod sulphate
 (c) *Pregnancy pyelitis*
 (1) Postural treatment
 Knee chest position
 (2) Hydrotherapy
 (3) Alkaline treatment
 ↓ (4) Ureteral catheterisation
 + (5) Pelvic lavage
 ↓ (6) Termination of pregnancy
 Ind Bilateral pyelitis + uræmia

(B) *Chronic pyelitis*

- Def 10 days after temp is normal
- Treat (a) Acid treatment with hexamine
 (b) Mandelic acid treatment
 (c) Urinary lavages
 (a) Bladder
 Acriflavine 1-8000
 Every day
 (β) Renal pelvis
 Acriflavine 1-2000
 Weekly

(B) PYELONEPHRITIS

Def Inflammation of renal pelvis and tissue

- Path types (1) **Aseptic pyelonephritis**
 Excretion of irritants
- (2) **Septic pyelonephritis**
 (A) **Descending or hæmatogenous**
 (a) Fulminating
 (b) Acute
 (c) Chronic
 (B) **Ascending pyelonephritis**
 (a) Fulminating
 (b) Acute
 (c) Chronic
 (C) **Pregnancy or puerperal pyelonephritis**
- Etio (a) Unilateral
 (β) Right kidney
 (γ) Fifth month
- Predispos (1) Urinary stagnation
 Due to (a) Vesical hypertrophy
 (b) Uterine pressure
 (2) Urinary infection
 B coli bacilluria
 (3) Constipation
 (4) Genital lesion
- Clinic (1) Presence of
 (a) Acute septicæmia
 or (b) **Lower urinary sepsis**
 or (c) Pregnancy or puerperium
 (2) **Sudden and high rise in temperature**
 (3) Acute urinary crisis
- Compl (1) Toxæmia
 (2) Uræmia
 (3) Pyonephrosis
- Treat (1) **Acute hæmatogenous pyelonephritis.**
 (A) **Mild**
 (a) Hydrotherapy

(b) Alkalies :

: Pot. citras grs. xxx
 Soda bi carb grs. xxv

: Every 6 hours

(c) Aperients

(d) 10 c cs. of 1% mercurochrome

: Intravenous

(e) Chemotherapy : sulphanilamide

(B) Severe :

(a) As in (A)

+ (b) Antiserum 25 c.cs.

↓ (c) Bladder lavage } acriflavine

↓ (d) Renal lavage } 1 : 5000

↓ (e) Nephrectomy :

Ind : (a) Fever for over 4 weeks

(β) Unilateral sepsis

(f) Nephrostomy :

Ind : Suppression of urine

(2) Acute ascending pyelonephritis :

(a) As in (1)

+ (b) Early suprapubic cystostomy :

Ind : Lower urinary obstruction

or (c) Nephrostomy :

Ind : Suppression of urine

(3) Chronic suppurative pyelonephritis :

(a) Catheter drainage + bladder lavage

+ (b) Fluids + diuretics + antiseptics

↓ (c) Eradication of etiology :

(a) Lower urinary sepsis

(β) Lower genital sepsis

(γ) Migration sepsis

(4) Pregnancy or puerperal pyelonephritis :

(A) Prophylactic

(a) Treatment of genital lesion

(b) Fluids + diuretics + alkalies

(c) Laxatives

(B) Curative :

(1) Unilateral :

(a) Treatment as under (A)

↓ (b) Hexamine + acid mixture

↓ (c) Mandelic acid treatment

↓ (d) Ureteral catheterisation drain :
 : With pelvis lavage

↓ (e) Nephrostomy :
 : With pelvis lavage

↓ (f) Nephrectomy

(B) Chronic pyelitis :

Def. : 10 days after temp. is normal

Treat : (a) Acid treatment with hexamine

(b) Mandelic acid treatment

(c) Urinary lavages :

(a) Bladder :

: Acriflavine 1-8000

: Every day

(β) Renal pelvis :

: Acriflavine 1-2000

: Weekly

(B) PYELONEPHRITIS :

Def : Inflammation of renal pelvis and tissue

Path. types : (1) **Aseptic pyelonephritis :**

. Excretion of irritants

(2) **Septic pyelonephritis :**(A) **Descending or hæmatogenous :**

(a) Fulminating

(b) Acute

(c) Chronic

(B) **Ascending pyelonephritis :**

(a) Fulminating

(b) Acute

(c) Chronic

(C) **Pregnancy or puerperal pyelonephritis :**

Etiology : (a) Unilateral

(β) Right kidney

(γ) Fifth month

Predisposing : (1) Urinary stagnation :

Due to : (a) Vesical hypertrophy

(b) Uterine pressure

(2) Urinary infection :

: B. coli bacilluria

(3) Constipation

(4) Genital lesion

Clinic : (1) Presence of :

(a) Acute septicæmia

or (b) **Lower urinary sepsis**

or (c) Pregnancy or puerperium

(2) **Sudden and high rise in temperature**

(3) Acute urinary crisis

Compl. : (1) Toxæmia

(2) Uræmia

(3) Pyonephrosis

Treat : (1) **Acute hæmatogenous pyelonephritis :**(A) **Mild :**(a) H₂O therapy

- (b) Alkalies :
 - : Pot. citras grs. xxx
 - Soda bi-carb grs. xxv
 - : Every 6 hours
- (c) Aperients
- (d) 10 c.cs. of 1% mercurochrome
- : Intravenous
- (e) Chemotherapy : sulphanilamide

(B) Severe :

- (a) As in (A)
- + (b) Antiserum 25 c.cs.
- ↓ (c) Bladder lavage } acriflavine
- ↓ (d) Renal lavage } 1 : 5000
- ↓ (e) Nephrectomy :
- Ind : (α) Fever for over 4 weeks
- (β) Unilateral sepsis
- (f) Nephrostomy
- Ind : Suppression of urine

(2) Acute ascending pyelonephritis :

- (a) As in (1)
- + (b) Early suprapubic cystostomy :
- Ind : Lower urinary obstruction
- or (c) Nephrostomy
- Ind : Suppression of urine

(3) Chronic suppurative pyelonephritis :

- (a) Catheter drainage + bladder lavage
- + (b) Fluids + diuretics + antiseptics
- ↓ (c) Eradication of etiology :
- (α) Lower urinary sepsis
- (β) Lower genital sepsis
- (γ) Migration sepsis

(4) Pregnancy or puerperal pyelonephritis :

(A) Prophylactic .

- (a) Treatment of genital lesion
- (b) Fluids + diuretics + alkalies
- (c) Laxatives

(B) Curative :

(1) Unilateral :

- (a) Treatment as under (A)
- ↓ (b) Hexamine + acid mixture
- ↓ (c) Mandelic acid treatment
- ↓ (d) Ureteral catheterisation drain :
- : With pelvis lavage
- ↓ (e) Nephrostomy :
- : With pelvis lavage
- ↓ (f) Nephrectomy

(2) *Bilateral*:

- (a) Medicinal + instrumental treat.
+ (b) Induction of premature labour

(C) PYONEPHROSIS.

Def. Dilatation and distension of kidney and its pelvis
with pus or purulent urine

Path. types. (1) **Uro-pyonephrosis**: Infected hydronephrosis

- (a) Renal type
(b) Pelvic type

(2) **Pyelonephritic pyonephrosis**(3) **Calculous pyonephrosis**

Clinic. (1) Pain

- (a) Lumbar
(b) Ureteral colic

(2) **Lumbar swelling**:

- (a) Tender
(b) Varying sized
(c) Reniform

(3) **Pyuria**: Quantity of pus depends on

- (a) Open variety
(b) Closed variety

(4) **Septic toxæmia**(5) **Primary etiology**:

- (a) Hæmatogenous
(b) Ascending urogenital

Diag. Pyuria varying conversely with lumbar swelling
and general toxæmia

Treat: (A) *Unilateral pyonephrosis*:

(1) Removal of etiology

+ (2) **Drainage**:

- (a) Ureteral catheter
or (b) Nephrostomy
or (c) Suprapubic cystostomy

↓ (3) **Nephrectomy**:

- Ind (a) Second kidney healthy
(b) General condition good
(c) Complete disorganisation

(B) *Bilateral pyonephrosis*:

(1) Removal of etiology

↓ (2) **Drainage**.

- (a) Suprapubic cystostomy
(b) Bilateral nephrostomy

(3) **No nephrectomy**

(D) CARBUNCLE KIDNEY :

Def : Multiple suppurative foci throughout the kidney tissue secondary to pyæmia due to a pyococcal cutaneous lesion

Etio : (a) Age : 30-50

(b) Predisp. : **Furuncle or carbuncle**

Path : Multiple minute abscesses in the kidney tissue

Clinic : (1) Presence of etiology : furuncle

(2) Persistent pyrexia

(3) Unilateral lumbar tenderness

(4) Leucocytosis

Compl : Pyæmia

Treat : (1) **Conservative :**

: Antipyococcal general treatment

(2) **Operative :**

(a) **Excision :** partial nephrectomy

(b) **Nephrectomy**

(E) PERIRENAL SEPSIS :**(1) PERINEPHRITIS :**

Def . Chronic fibro lipomatous inflammation within the perinephric sheath

Types . (A) Sclerotic . adhesions

(B) Fibro lipomatous : altered fat

(2) PERINEPHRIC ABSCESS :

Def : Pus in the perinephric cellular tissues

Etio : (a) Adult men

(b) Right side

Causes (A) **Primary :** Hæmatogenous

Etio : Furunculosis

Path Pyæmic abscess

(B) **Secondary :**

(a) **Kidney lesions :**

(1) Trauma → perirenal hæmatoma

(2) Kidney suppuration :

(a) Renal calculus

(β) Pyelonephritis

(γ) Pyonephrosis

(δ) Abscess or infarct

(b) **Neighbouring lesions :**

(1) Appendix

(2) Colon

(3) Ureter

(4) Pelvic organs

(5) Spine or ribs

(6) Pleura

Sources of infection

- (1) Renal
- (2) Perirenal organs
- (3) Local
- (4) Distant pyæmic

- Path types
- (1) Acute pyococcal
 - (2) Chronic tuberculous

- Anatomy
- (1) **Supra nephric**
Intra thoracic or sub phrenic
 - (2) **Sub nephric**
 - (a) Retrocæcal appendix
 - (b) Iliac lymphadenitic abscess
 - (3) **Ante nephric**
 - (4) *Retro nephric* Most common
 - (a) Local causes
 - (b) Distant causes
 - (c) Regional causes

- Bacterio
- (a) Pyococci staphylo or strepto
 - (b) B coli
 - (c) B tuberculosis

- Clinic types
- (1) Acute 10 days
 - (2) Sub acute 3 4 weeks
 - (3) Chronic months

- Clinic (A) **Acute perinephric abscess**

- (1) *Local signs*
 - (a) Pain
 - (b) Spasm
 - (c) **Swelling**
 - (d) **Costo vertebral tenderness**
 - ↓ (e) Superficial inflammation
 - + (f) Fluctuation
- (2) *Pressure or regional signs*
 - (a) Supra nephric
 - (a) Jaundice (personal case)
 - (β) Ascites
 - (γ) Basal pleurisy
 - (b) Sub nephric
 - (a) Psora irritation
 - (β) Testis retraction
 - (c) Retro nephric
Edema and fullness in loin
 - (d) Ante nephric
Palpable anterior swelling
- (3) *General signs* Septic toxæmia
 - (a) **Pyrexia**
 - (b) **Blood examination**

(B) Chronic perinephric abscess :

- (a) Fullness in the loin
- (b) Bimanual palpation
Fluctuating swelling

(C) Latent perinephric abscess :

General toxæmia with no local signs

Special signs (1) Plain X Rays

Blurring of the psoas outline

(2) Sign of Mathe (Med Ann 1940)

Loss of mobility of the kidney between Trendelenburg and upright positions as shown by excretion pyelography

(3) Lateral retrograde pyelogram

- (a) Forward displacement of the kidney
- ↓ (b) Arch like appearance of kidney and ureter

Diff diag (1) General infections :

Typhoid, septicæmia

(2) Local conditions .**(A) Intraperitoneal :**

- (a) Appendix
- (b) Cæcum
- (c) Gall bladder
- (d) Liver

(B) Extraperitoneal .

- (a) Kidney and ureteral affections
- (b) Retrocæcal appendix
- (c) Vertebral and rib affections
- (d) Psoas abscess
- (e) Iliac lymphadenitis

Compl (1) Rupture

- (a) Outside
- (b) Pleura
- (c) Peritoneum
- (d) Colon
- (e) Bladder

(2) Fistulæ**(3) Pressure syndrome****(4) Septic complications**

Septicæmia, pyæmia

Treat (A) General antiseptic

- (a) Sulphonamides
- (b) Intravenous dyes
- (c) Vaccines or sera

(B) Local**(1) Conservative**

Fomentations, hip baths

(2) Operative

- (a) Incision and drainage

↓ (b) Treatment of primary focus

(3) RENAL AND PERIRENAL FISTULÆ:

(A) Urinary fistulæ:

Varieties: (a) Spontaneous:

- (α) Infective
- (β) Malignancy

- (b) Traumatic
- (c) Post-operative

- Etio. (1) Urinary obstruction: Stricture
 (2) Urinary sepsis: Pyonephrosis
 (3) Nature of infection: T.B.
 (4) F.B.: Calculus

- Diagnosis: (1) History of etiology.
 (α) Renal or ureteral sepsis
 (β) Perirenal abscess
 (2) Urinary discharge: urea
 (3) Dye tests: Intravenous or intramuscular
 (α) Indigocarmine
 (β) Methylene blue
 (4) Pyelography
- Treat. (1) Remove the etiology
 (2) Drainage
 . Of the pelvis by ureteral catheters
 (3) Nephrectomy

(B) Non-urinary fistulæ:

- Causes: (a) Empyema
 (b) Appendicular abscess
 (c) Tuberculous
 (α) Vertebra
 (β) Rib
 (γ) Ileum
 (δ) Sacro iliac joint
 (d) Subphrenic abscess
 (e) Carcinoma colon

- Diag (1) Pyelography
 (2) X Ray after opaque injection.
 . (Fistulography)

(V) RENAL TUBERCULOSIS:

Etio: Sex: women

Age: young adults

Side: Unilateral, right side

Incidence: 30% of surgical lesions of the kidney

Path: (A) Primary Hæmatogenous

(B) Secondary Ascending

- (a) Ureteral
- (b) Lymphatic

Morb. anat: (1) Miliary

(2) Ulcero cavernous: Pyelonephritic

- (3) Ulcerative
- (4) Massive caseous
- (5) Hydronephrotic
- (6) Pyonephrotic
- (7) Pseudo calculous
- (8) Nephritic
 - Parenchymatous and interstitial
 - (a) Primary tuberculous
 - (b) Secondary toxic
- (9) Bacilluric
- (10) Perinephric abscess •
 - (a) Renal T B
 - (b) Extra renal T B
 - (α) Spine
 - (β) Ribs
 - (γ) Ileum
 - (δ) Sacro iliac joint
- (11) Adhesive perinephritis and peri ureteritis

- Clinic
- (1) Vesical syndrome •
 - (a) Diurnal frequency
 - (b) Vesical tenesmus
 - (2) Urine changes •
 - Poly hæmat pyuria (*acid sterile pyuria*)
 - (3) Local syndrome
 - Pain + swelling
 - (4) Associated lesions •
 - (a) Lower genito urinary focus
 - (α) Prostate
 - (β) Testis
 - (γ) Ureter
 - (b) Chest
 - (c) Lymph glands
 - (5) General tuberculous toxæmia

Special signs

- (1) Urine examination for T. B •
 - (a) Microscopical 72% positive
 - (b) Cultural 98% positive
- (2) Cystoscopy : Ureteric orifice
 - (a) Hyperæmia
 - ↓ (b) Swollen ureteric orifice
 - ↓ (c) Tubercles round about
 - ↓ (d) Golf hole orifice
- (3) Chromo-cystoscopy
 - Delay in appearance of the dye
- (4) Ureteric catheterisation of the sound side
 - To find the state of the sound kidney
- (5) Pyelography : Intravenous

- (A) *Abnormal outline*
 - (a) Irregular or *mottled pelvis*
 - (b) Renal cavitation or abnormal shadow
 - (c) *Irregular ureter*
- (B) Delay in excretion
- (6) Presence of a primary tuberculous focus
 - (a) Urinary
 - (b) Genital
 - (c) Extra urogenital
- (7) Guinea pig test 94% positive
- Compl
 - (1) Urinary sepsis
 - (2) Uræmia
 - (3) Spread to lower urinary organs
 - Cystitis and then to the other side
 - (4) T B toxæmia
- Treat (A) *Radical*
 - : Nephrectomy + ureterectomy
 - Ind Unilateral primary renal T B
 - Contra
 - (a) Bilateral renal T B
 - (b) Inefficient other kidney
 - (c) Tuberculosis elsewhere
 - (d) General low condition
 - Special tech
 - (a) Carbolisation of cut ureteral stump
 - (b) Free the kidney outside perirenal fascia
 - (c) Carbolisation of cut renal pedicle
 - Post compl Unhealing sinus
 - Treat Ureterectomy
 - (B) *Conservative*
 - Ind
 - (a) Nephrectomy contraindicated
 - (b) Post operative
 - Tech General anti tuberculous treatment

(VI) RENAL CALCULUS: (See under LITHIASIS)

Def An agglomeration of crystals held together by irreversible colloid

Etio Average age 38 years (adults)

Causative factors

(A) Primary stones :

(1) Metabolic errors

- (a) Congenital
 - (α) Urate and uric acid
 - (β) Cystinuria
 - (γ) Phosphaturia

(b) Acquired hyperparathyroidism

(2) Dietetic errors :

- (a) Lack of vitamin A
- (b) Abnormal fluid intake
 - (α) Hard water
 - (β) Less water

- (3) **Geographical factor :**
Sandy and dry countries
(4) **Prolonged immobilisation**
Leading to skeletal decalcification

(B) **Secondary stones :**

- (1) **Urinary obstruction :**
↓ (a) Urinary stagnation
↓ (b) Precipitation of salts due to
(α) Concentration
(β) Change in chemical reaction
(γ) Inflammation

(2) **Urinary sepsis**

- athology (A) **Precipitation of salt :** Due to
(a) Excess
(α) Metabolic hyper parathyroidism
(β) Concentration stagnation
(b) *Change in chemical reaction*
(c) Bacterial fermentation
(d) Congenital urates and uric acid

+ (B) **Presence of irreversible colloid :** Fibrin

+ (C) **Nucleus -**

- (a) Chemical
(α) Ammon urate in infants
(β) Uric acid in adults
(γ) Calc. oxalate in old
(b) F B blood clot, bacteria, etc.

Compos (1) **Calcium oxalate -** Most common

- Etio (a) Hyperchlorhydria
(b) Faulty diet

Morb anat *Spiculated mulberries*

Clinic Early symptoms

Sign Good X Ray shadows

(2) **Uric acid :**

Morb anat *Shaligrams*

Single or multiple

Sign *No X Ray shadows*

(3) **Urates :**

Etio Children

Morb anat Soft, yellow, friable

Multiple

Sign *No X Ray shadows*

(4) **Calcium phosphate :**

Morb. anat Hard, irregular, greyish white

Sign. Good X Ray shadows

(5) **Triple phosphates :** Common

Etio Urinary stagnation + sepsis

- Comp (a) Calcium phosphate
 + (b) Ammonium phosphate
 + (c) Magnesium phosphate

Morb anat *Friable, large, stag horn*

Sign Decomposed alkaline urine

(6) Cystin

Morb anat Yellow → olive green waxy

Sign Cystinuria

(7) Xanthin

(8) Indigo

(9) Fibrin

(A) *Primary constituents*

(1) **Oxalates** Diet

(2) **Uric acid and urates.**

Congenital metabolic errors

(B) *Secondary constituents*

(1) **Calcium:**

(a) Acquired metabolic errors

or (b) Local inflammation

(2) **Phosphates:**

Alkaline reaction

Sites (1) Kidney tissue silent stones

(2) Calyces

(3) Kidney pelvis

Clinic (A) *Silent stones* kidney tissue stones

(a) Accidental X Ray finding

(b) Accidental operative finding

(B) *Renal calculus syndrome*

(1) **Pain:**

(a) Fixed lumbar pain

(b) Renal colic → strangury

(c) Referred to

(1) Bladder tenesmus

(2) Tip of the penis

(3) Testis

(4) Thigh, foot, heel

(5) Other kidney

(2) **Hæmaturia:** With strangury

(3) **Abnormal micturition:**

Frequency, strangury, difficulty

(4) History of lithiasis

Signs (1) **Urine examination.**

(a) Hæmaturia

(b) Pyuria

(c) Crystaluria

(2) **X-Rays:** Of the whole urinary tract

(a) Ordinary in two planes

- (b) Pyelography
 - (a) Excretory
 - (β) Instrumental or ascending

- (3) Cystoscopy
- (4) Renal function tests

Diff diag *Of an opaque shadow*

- (a) Calcareous lymph gland
- (b) Phlebolith
- (c) Enterolith
- (d) Calcification or ossification
- (e) Gall stones

Diff diag *Of renal calculus*

- (1) *Renal*
 - (a) Lithiasis Crystaluria
 - (b) T B
 - (c) Hydronephrosis
 - (d) Pyelitis or pyelonephritis
 - (e) Movable kidney
 - (f) Renal growths
 - (g) Polycystic kidney
- (2) *Other organs*
 - (a) Gastro duodenal lesions
 - (b) Intestinal lesions
 - (c) Gall bladder lesions
 - (d) Appendicular lesions
 - (e) Spinal lesions
 - (f) Psoas lesions

Compl (1) Migration Renal and ureteral colic

(2) Obstruction

(A) Calculous anuria

Acute and complete obstruction

Def Suppression of urine due to failure of function of both the kidneys

- Causes
- (1) Bilateral stone impaction
 - (2) Unilateral stone impaction
+ Reflex inhibition of other kidney
 - (3) Unilateral stone impaction
+ Inefficient other kidney

- Clin c
- (a) Stage of onset
 - (a) Renal colic + hæmaturia
 - ↓ (β) Anuria
 - (b) Stage of tolerance
 - (a) Absence of micturition
 - (β) Empty bladder
 - (r) No general toxæmia
 - (c) Stage of uræmia

- (a) Nervous :
Headache, insomnia, delirium,
hallucinations, convulsions,
drowsiness, coma
- (β) Digestive
Anorexia, thirst, hiccough,
parrot tongue, vomiting,
distension, constipation,
diarrhoea
- (γ) Muscular
Twitchings, convulsions

Signs (1) Easy passage of a catheter in an empty bladder

(2) X-Rays .

Stone in ureter or pelvic outlet

(B) Hydronephrosis :

Chronic and incomplete obstruction

(C) Stricture ureter

(3) Infection .

- (a) Pyelitis
- (b) Pyelonephritis
- (c) Pyonephrosis
- (d) Perinephritis
- (e) Perinephric abscess
- (f) Renal fistulæ

(4) New growths : (Association in 50% of cases of epidermoid carcinoma of pelvis)

Diagnosis All symptoms of urinary stones are

- (a) Increased by movements
- & (b) Decreased by rest

Treatment (A) *Prophylactic* removal of the etiology

- (a) Metabolic and dietetic
- (b) Plenty of fluids
- (c) Treatment of
 - (α) Urinary obstruction
 - (β) Urogenital sepsis

(B) *Symptomatic*

(1) Renal colic .

- (a) Hot hip bath
- (b) Atropine (*no morphia*)

(2) Hæmaturia :

- (a) Rest and morphia
- (b) Coagulants
- (c) Local ice bag

(3) Calculous anuria : Period of tolerance

- (a) Distension of bladder with warm lotion

- ↓ (b) Radiography
- ↓ (c) Cystoscopy
- ↓ (d) Ureteral catheterisation :
 - (α) Displace the impaction
 - (β) Pelvis drainage
- + (e) Continuous intravenous therapy
 - (α) Sodium sulphate
 - (β) Glucose saline
- + (f) Fluids, alkalies, diuretics
- ↓ (g) Nephrostomy :
 - Ind Failure of conservatism
 - Site (a) Site of last pain
 - (b) Sign de Legueu
 - (c) Spasticity over kidney
 - (c) X Ray evidence
- Post treat Continuous intravenous sodium sulphate and glucose
- (C) *Calculus treatment proper*
 - (1) *Medicinal*
 - Ind (a) In association with other treatment
 - (b) Bilateral calculi
 - (c) Small scattered stones
 - Tech (See under Lithiasis)
 - (a) Diuretics fluids & alkalies
intravenous soda sulph
 - (b) Antiseptics hexamine group
 - (c) Dietetic Avoidance of
 - (α) Oxaluria Berries
Tomatoes
Rhubarb
 - (β) Uric acid kidney
Liver
Brains
 - (2) *Instrumental* (See under Ureters)
 - (3) *Operative*
 - Ind (a) Repeated pain
 - (b) Continued hæmaturia
 - (c) Appearance of complications
 - Contra (a) Extensive bilateral metabolic calculi
 - (b) Renal failure with uræmia
 - (c) Very small and multiple shadows
 - (d) Poor general condition
 - Tech (A) *Unilateral cases*
 - (1) *Nephro lithotomy :*
 - Ind (a) Large branched stone with healthy kidney
 - (b) Collection of stones in dilated calyx

(2) **Pyelo-lithotomy :**

- Ind (a) Moderate stone in pelvis
 (b) Few small stones in a calyx or calyces

(3) **Partial nephrectomy :**

- Ind Stone in a shut off calyx

(4) **Total nephrectomy :**

- Ind (a) Primary
 (1) Hydro pyonephrosis
 (2) Renal atrophy
 (3) Renal malignancy
 (4) Very big stone
 (5) Multiple stones
 (6) Hæmaturia or pyuria
 or (b) Secondary
 (1) Recurrent stones
 (2) Nonhealing fistulæ
 (3) Prolonged sepsis
 + (c) Always

Second kidney healthy

(B) *Bilateral cases*

- Ind (a) Expectation of renal function recovery after stone removal

- (b) One side advanced than the other

Contra Both kidneys inefficient

Tech Two stage nephrolithotomy

- (a) Better side operation

- ↓ (b) 6 months

- ↓ (c) Other side operation

Post compl

- (1) Hæmorrhage
 (2) Shock
 (3) Paralytic ileus
 (4) Urinary sepsis
 (5) Acute uræmia

- Sequelæ (1) Perirenal fistulæ
 (2) Recurrences
 (3) Chronic uræmia
 (4) Lumbar scar hernia

(VII) **POST-TRANSFUSION NEPHRITIS:**

Etio Previous existing nephritis

Clinic (a) Stage of alarm

- ↓ (b) Stage of anuria or oliguria

- ↓ (c) Stage of polyuria

- ↓ (d) Terminal stage

- (a) Uræmia

- or (b) Recovery

Treat (1) Intravenous soda bi-carb

- (2) Decapsulation

(VIII) RENAL NEOPLASMS:**(A) RENAL PELVIS TUMOURS**Varieties - (a) *Benign*.**(1) Angiomata :**

Painless, profuse hæmaturia

(2) Papillomata :

(a) Painless, profuse hæmaturia

(b) Pelvic obstruction

(c) Implantation

Along the lower urinary organs

(d) Malignant degeneration

(b) Malignant**(1) Papillary carcinoma :**

Infiltrating papilloma

(2) Epidermoid carcinoma :

(a) Squamous leukoplakic

(b) Associated with calculus > 50%

Symptoms (1) **Pain :** (a) Lumbar
(b) Renal colic(2) **Hæmaturia** (a) *Pronounced*
(b) *Persistent*
(c) *Painless*(3) **Tumour :** (a) Hydronephrosis
(b) Hæmonephrosis
(c) PyonephrosisSigns (1) **Cystoscopy** (a) Bloody efflux from ureter
(b) Ureteral prolapse
(c) Visible growth in bladder(2) **Pyelography** (a) *Excretory*
(b) *Instrumental***(B) RENAL TISSUE TUMOURS**Varieties (1) *Adult age***(A) Adeno carcinoma :**Synonym (a) Hypernephroma
(b) Grawitz tumourEtiology Age 30-50
Unilateral

Path Carcinoma of Wolffian body

Morb anat Polar, cortical, adrenal like, yellowish
red coloured, encapsuled, lobulated
and variegated on cut surface.Metastases (a) Along renal vessels
(b) Along perirenal tissues

(2) **Pyelo-lithotomy :**

- Ind (a) Moderate stone in pelvis
 (b) Few small stones in a calyx or calyces

(3) **Partial nephrectomy :**

- Ind Stone in a shut off calyx

(4) **Total nephrectomy :**

- Ind (a) Primary
 (1) Hydro pyonephrosis
 (2) Renal atrophy
 (3) Renal malignancy
 (4) Very big stone
 (5) Multiple stones
 (6) Hæmaturia or pyuria
 or (b) Secondary
 (1) Recurrent stones
 (2) Nonhealing fistulæ
 (3) Prolonged sepsis
 + (c) Always

Second kidney healthy

(B) *Bilateral cases*

- Ind (a) Expectation of renal function recovery after stone removal
 (b) One side advanced than the other
 Contra Both kidneys inefficient
 Tech Two stage nephrolithotomy
 (a) Better side operation
 ↓ (b) 6 months
 ↓ (c) Other side operation

Post compl

- (1) Hæmorrhage
- (2) Shock
- (3) Paralytic ileus
- (4) Urinary sepsis
- (5) Acute uræmia

Sequelæ

- (1) Perirenal fistulæ
- (2) Recurrences
- (3) Chronic uræmia
- (4) Lumbar scar hernia

(VII) POST-TRANSFUSION NEPHRITIS:

Etiol Previous existing nephritis

- Clinic (a) Stage of alarm
 ↓ (b) Stage of anuria or oliguria
 ↓ (c) Stage of polyuria
 ↓ (d) Terminal stage
 (a) Uræmia
 or (3) Recovery

- Treat (1) Intravenous soda bi-carb
 (2) Decapsulation

- (2) **Tumour:** (a) Unilateral
(b) Bilateral
- (3) Metastases by local infiltration
- (4) **Cachexia**

(C) **General signs:**

- (1) Pain (a) Clot colic
(b) Tension pain
(c) Neuralgia
- (2) Urine Blood, pus, growth
- (3) Cachexia

Signs *Of renal tissue tumours*

- (1) Urine examination
- (2) **X-Rays:** (a) Plain abdomen, chest, bones
(b) Pyelography
(a) Excretion
(β) Instrumental

Renal shadow deformity

- (3) **Cystoscopy**
- (4) Kidney function tests
- (5) **Exploration**

Diff diag

- (1) Renal affections
- (2) Suprarenal growths
- (3) Liver or spleen enlargements
- (4) Retroperitoneal malignancy

Treat (1) **Radical nephrectomy:**

- Ind (a) Other kidney efficient
(b) Local operability
(c) General condition good

- Contra (a) Local infiltration + +
(b) Distant secondaries
(c) Inadequate other kidney
(d) Cachexia
(e) General condition bad

Tech Nephrectomy with perirenal fat and upper ureter, by abdominal or lumbar route

(2) **Irradiation:**

- Ind (a) Pre operative
(b) Post operative
(a) Preventive
(β) Recurrences
(c) Substitutive
Inoperable cases

(IX) **RENAL OPERATIONS:**

(1) *Pre operative investigations*

(A) **Estimation of renal efficiency:**

(See under Chapter 1)

(B) **Estimation of circulatory efficiency:**

(c) **Spinal**

(d) **General .** (α) **Inhalation**

(β) **Intravenous evipan**

Position : (1) **Lateral on the sound side :**

With : (α) **Flexion of lower hip and knee**

+ (b) **Extension of upper hip and knee**

or (1) **Prone**

+ (2) **Stuffing under the loin :**

(α) **Air cushion**

(b) **Sand bag**

(c) **Kidney rest**

(A) **EXPLORATION :**

Ind : (α) **Profuse renal hæmaturia**

(b) **Renal pain**

(c) **Renal tumour**

(d) **Renal sepsis**

(e) **Renal calculus**

(f) **Obstructive anuria**

(g) **Decapsulation**

Tech . (1) **Incisions :** **Posterior or lumbar route**

(A) **Morris :**

. **Costomuscular angle**

↓ **Ant sup iliac spine**

(B) **Mayo :** **L shaped**

(α) **Vertical over erector .**

From 12th rib for 3"

↓ (b) **Parallel to and near iliac crest**

(C) **Thomson-Walker :**

(α) **Vertical over erector :**

. **From 12th rib**

↓ (b) **Horizontal midway between
last rib & iliac crest**

↓ (2) **Division of muscles .**

(α) **Lat dorsi + serratus post. inferior**

↓ (b) **External and internal oblique**

↓ (3) **Incision of lumbar fascia :**

: **At the lateral border of quad. lumb.**

. **(Save 11th intercostal vessel & nerve)**

↓ (4) **Separation of peritoneum :**

: **From transversalis fascia**

↓ (5) **Incise perirenal fascia of Zuckerkandl**

↓ (6) **Isolation of the kidney with its pedicle :**

: **By blunt dissection all around**

- (a) Heart
- (b) Arteries
- (c) Blood pressure
- (C) **Estimation of general condition :**
 - (a) Blood . (a) Hæmoglobin
 - (β) Coagulation
 - (b) Nervous system
 - (c) Metabolism
- (2) *Pre-operative treatment :*
 - (A) *Urinary :*
 - (a) **Diuretics :** Hydrotherapy
 - (b) **Antiseptics :** R

Hexamine grs	x	before meals
+ R		
Acid phosph dil.	m.	viii
Acid nitrohydrochlor dil.	m	viii
Liquor strychnini	m	iii
Spt chloroformi	m.	x
Inf. gentianæ co	ad ounce	½
T. D. S after meals		
 - (c) **Preliminary drainage with lavage :**
 - (a) Urethral
 - (β) Suprapubic
 - (B) *Alimentary .*
 - (a) **Diet :** Light nutritious food
Plenty of barley and sugar
 - (b) **Laxatives :** Cascara evacuant
Every night for two weeks
 - (c) **Antiseptics :** Carbon, salol, bismuth
 - (C) *Circulatory*
 - (a) **Heart tonics :** digitalis
 - (b) **Hæmatinics**
 - (c) **Blood coagulants**
 - (D) *Anti acidosis .*
: Glucose, soda bi carb, salines
 - (E) *Respiratory*
 - (a) Correction of any pre existing disease
 - (b) Anti pneumonic prophylaxis
 - (c) Anti-catarrhal vaccines
 - (F) *General .*
 - (a) **Blood transfusion**
 - (b) Correction of metabolic diseases
 - (c) Tonics
- (3) *Operative technique .*
 - Anæsth . (a) Local
 - (b) Regional . paravertebral

- (5) Isolation of incision field by packs
- (6) Incision in the long axis of the pelvis
- (7) Removal of the stone
- (8) Inspection of the stone
 - (a) Fracture
 - (b) Facets
 - (c) Comparison with X Ray picture
- (9) Search for other stones
 - In (a) Pelvis
 - (b) Calyces
 - (c) Ureter
 - (d) Renal tissue
- (10) Passage of a ureteric catheter down into the bladder
- (11) Suture of the pelvic incision
Cover with fibro fatty layer
- (12) Drainage tube in perinephric area
- (13) Closure

If the kidney cannot be delivered but pelvis is accessible

- (a) No suture of the pelvis
- + (b) Wide bore drainage

(2) NEPHRO-LITHOTOMY

Ind Stone in the renal tissue

- Tech
- (1) Exposure and deliverance of kidney
 - (2) Digital compression of renal pedicle
 - (3) Search for the stone by
 - (a) Palpation
 - (b) Needling
 - (c) Probing
 - (d) Incision
 - (4) Passage of a guide upto the stone
 - (5) Incision along the guide
 - (6) Extraction of the stone
 - (7) Examination of the stone
 - (8) Search for all other stones
 - (9) Closure
- With
- (a) Pelvic drain if sepsis
 - (b) Perinephric drain

(D) NEPHROPEXY (Thomson-Walker)

- Tech
- (1) Clearance of fat from post abd wall
 - (2) Posterior decapsulation of the kidney
 - (3) Three sutures of no 4 catgut

Between (a) Kidney

And (x) Angle of 12 rib and erector spinæ

↓ (7) Deliver of the kidney outside wound

↓ (8) Exploration

of (a) The kidney

(b) The pelvis

(c) The ureter

by (1) Inspection

(2) Palpation

(3) Probing

(4) Incision

↓ (9) Treatment of the focus

↓ (10) Closure

(a) Muscles

Interrupted no 3 chromic catgut

(b) Fascia

Continuous no 2 chromic catgut

Alter tech (Hamilton Bailey Emergency Surgery)

(1) Vertical incision of erector spine sheath

↓ (2) Medial retraction of erector spine

↓ (3) Vertical incision of deeper layer of the sheath

↓ (4) Medial retraction of quadratus lumborum

↓ (5) Lateral retraction of extraperitoneal fat

↓ (6) Tear through the fascia of Zuckerkandl

(B) NEPHROSTOMY

Ind (1) Calculous anuria

(2) Pyelonephritis

(3) Hydronephrosis

Methods (1) Bailey's diathermy method

(2) Cabot's method

Tech (1) Exposure

(2) Incision just behind the convex border

(3) Passage of finger in renal pelvis

(4) Put in a tube and stitch it to the capsule

(5) Corrugated rubber in perinephric area

(6) Closure

(C) LITHOTOMY

(1) PYELO LITHOTOMY

Ind (a) Stone free in renal pelvis

(b) Stone in calyx opening in the pelvis

(c) Stone in upper end of ureter

With (d) Kidney capable of delivery

Tech (1) Exposure

(2) Deliver the kidney out of the wound

(3) Clearance of post. wall of the pelvis

(4) Milking, isolation & fix. of stones

- Contra (1) Inoperable malignancy
 (2) General contraindications
 (3) *Contralateral renal inadequacy*

Tech (A) Lumbar Nephrectomy ·

- (1) Exposure
- (2) Examination of the focus
- (3) Assessment of indications and contraind
- (4) Isolation, ligature between clamps and division of the ureter, with carbolic
 ation of lower stump
- (5) Isolation of kidney and its pedicle .
 By blunt dissection on all sides
- (6) Transfixion ligature of the renal pedicle
 by (a) Pedicle needle
 (b) Clamping
 (c) *Double ligature on proximal side*
 with No 4 catgut or silk
- or (6) Clamp & ligate individual vessels
 As close to the kidney as possible
- (7) Division of the pedicle
- (8) Removal of the kidney
- (9) Closure with drainage

(B) Transperitoneal nephrectomy :

- Ind (a) Very large renal tumours
 (b) Associated intraperitoneal trauma

- Tech (1) Incision
 (a) T shaped
 (a) Paramedian
 + (β) 11th rib to 2 above umb
 (b) Transverse
 Umbilicus to tip of 12th rib
- (2) Division & retraction of abd muscles
 - (3) Peritoneal incision
 - (4) Peritoneal exploration
 (a) Liver
 (b) Renal pedicle
 (c) Peritoneal cavity
 (d) Other kidney
 - (5) Packing off the operation area
 - (6) Incision of post. peritoneum
 Outer side of the colon
 - (7) Stripping of the peritoneum inwards
 - (8) Ligate & divide ureter & renal vessels
 . As far away from kidney as possible

(β) Outer edge of quadr lumb

(γ) Outer edge of quadr lumb

(E) RENAL DECAPSULATION

Syn Edebohls's operation

Ind (a) Acute or subacute parenchymatous nephritis
With threatened uræmia

(b) Suppurative pyelonephritis

(c) Nephritis dolorosa

(d) Acute post scarlatinal nephritis

(e) Hæmorrhagic nephritis

Anæsth Local infiltration

Position Completely prone

Tech (1) Lumbar incision

(2) Isolation of the kidney

(3) Incision of the capsule

Along the convex border

(4) Peeling off of each leaf towards hilum

(5) Closure with drainage

(6) Repeat on other side

(F) NEPHRECTOMY*Second kidney must be healthy*Ind (1) **Renal tuberculosis**: Unilateral(2) **Calculus**(a) **Large and multiple stones**.

(b) Atrophy of the kidney

(c) Septic complications

(a) Pyonephrosis advanced

(β) Fistulæ inveterate

(γ) Secondary hæmorrhage

(d) Recurrences

(e) Malignancy

(3) **Hydronephrosis** advanced(4) **Pyelonephritis or pyonephrosis**:
Advanced(5) **Malignancy** ·

Where no contraindications

(a) Grawitz

(b) Wilms

(c) Carcinoma

(d) Sarcoma

(6) **Urinary perirenal inveterate fistulæ**(7) **Trauma to the kidney**:

(a) Rupture or penetrating wound

(b) Uncontrollable hæmorrhage

(c) Advanced sepsis

(8) **Carbuncle of the kidney**(9) **Aneurysm of the renal artery**

- (a) Diuretics
- (b) Urinary antiseptics
- (c) Tonics

R/ Tr. ferri perchlor	m x
Acid phosph dil	m viii
Acid nitrohydrochlor dil	m viii
Liquor strychnini	m iii
Spt chloroformæ	m x
Aqua	ad ounce $\frac{1}{2}$

(6) Bowels :

- (a) First 48 hours
 - Flatus tube
- (b) At the end of 48 hours
 - (1) Simple enema
 - ↓ (2) Turpentine or ox gall enema
 - ↓ (3) Repeat 8 hours after
 - ↓ (4) Laxatives by oral route every night
 - + (5) Enema every morning
- (c) If flatulence and vomiting
 - (1) Draught of hot water with a tea spoonful of soda bi carb
 - (2) Tr iodine m iv in half a glass of water
Every half an hour
 - (3) Mist pepsinæ c morphinæ co .
Drachm $\frac{1}{2}$ every hour
 - (4) Adrenaline chloride m x
In half a glass of water every hour
 - (5) Stomach lavage with soda bi carb sol

(7) Post-operative insomnia :

- (a) First 24 hours
 - (a) Morphia
 - (β) Rectal aspirin + bromide in glucose saline
- (b) After 48 hours
 - (a) Medinal grs. 7½
 - (β) Empirin co grs 10
 - (γ) Soneryl

(8) Retention of urine :

- (a) Change in position
- (b) Hydrotherapy
- (c) Suprapubic fomentations
- (d) Catheter drain
- + (e) Intravenous soda sulph

(9) Post-operative hiccough :

- (a) Tr iodine in minim doses
- (b) Adrenaline in minim doses
- (c) Morphia $\frac{1}{4}$ gr + atropine 1/100 gr.
- (d) Gastric lavage
- (e) Co₂ inhalations

- (9) Isolation and removal of
 - (a) Kidney with its pedicle
 - (b) Suprarenal gland
 - (c) Perinephric fat
 - (d) Ureter
 - (e) Covering peritoneum
- (10) *Stab drain*
At the outer border of quad lumb
- (11) Suture of the post peritoneum
- (12) Closure of the abdomen

(C) Partial nephrectomy

- Ind (a) Bifid kidney and pelvis
With one part diseased
- (b) Laceration of the kidney
- (c) Polar carbuncle or stone
- Tech (1) Exposure
- (2) Temporary control of the pedicle
Manual pressure
- (3) Wedge shaped resection
- (4) Deep mattress sutures
 - (a) No 2 chromic catgut
 - (b) Interposed muscle graft
- (5) Capsule suture
Continuous no 1 chromic catgut
- (6) Closure with drainage

(4) *Post operative treatment*

(1) *Position* •

- (a) Ease the tension on the wound
- (b) Drainage tube to be lower most

(2) *Post-operative pain* •

- (a) Rectal saline ounces 10
Glucose 5%
Pot Bromide grs 40
Aspirin grs. 30
- (b) Morphia $\frac{1}{2}$ gr or heroin $\frac{1}{4}$ gr
- (c) Empirin Compound grs. 10
At 6 hourly intervals after 24 hours

(3) *Post-operative shock*

- (a) Preliminary blood transfusion
- (b) Delicate handling
- (c) Usual anti shock treatment

(4) *Fluids* •

- (a) Oral
- (b) Rectal
- (c) Subcutaneous
- (d) Intravenous

(5) *Medicines* :

- (a) Diuretics
- (b) Urinary antiseptics
- (c) Tonics

R/ Tr ferri perchlor	m x
Acid phosph dil	m viii
Acid nitrohydrochlor dil.	m viii
Liquor strychnini	m iii
Spt chloroformæ	m x
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- (b) Adrenaline in minim doses
- (c) Morphia ½ gr + atropine 1/100 gr
- (d) Gastric lavage
- (e) Co2 inhalations

- (6) *Signs and symptoms of abnormal renal mobility and renal calculus are aggravated by movements and relieved by rest.*
- (7) *Main factor which keeps the kidney in its normal position is adequate intra abdominal pressure maintained by tonic contraction of the abdominal muscles*
- (8) *Every mobile kidney is a potentially pathological kidney and hence requires attention*
- (9) *In uric acid stones, keep the urine alkaline, in phosphatic stones, keep the urine acid, in oxalate stones, no chemical treatment is indicated*
- (10) *Clinical types of renal affections*
 - (a) *Painful type*
 - (α) Local
 - (β) Referred
 - (b) *Tumour type*
 - (c) *Inflammation type* urinary sepsis
 - (d) *Obstruction type*
 - (α) Anuria acute
 - (β) Chronic uræmia
 - (e) *Bladder type*
 - (α) Cystitis
 - (β) Distension
 - (f) *Urinary type* abnormal urine
 - (g) *Micturition type* abnormal micturition
 - (α) Tenesmus or strangury
 - (β) Retention
 - (γ) Incontinence
 - (δ) Frequency
 - (h) *Latent type* symptomless
- (11) *Renal disease complications*
 - (a) *Urinary colic*
 - (b) *Urinary obstruction*
 - (α) Local effects colic
 - (β) Systemic effects anuria
 - (γ) General effects uræmia
 - (c) *Urinary infection*
Descending urinary infection
 - (d) *Stone formation*
 - (e) *New growth*
 - (f) *Metabolic changes*
 - (α) Uræmia
 - (β) Arteriosclerosis
 - (γ) Hypertension
- (12) *Hæmaturia following an accident with no local or general signs should be put to bed with pulse chart, being given*

- (a) Urinary antiseptics
- & (b) Blood coagulants
- (13) *In every case of hæmaturia due to renal trauma, every specimen of urine should be saved and stored in glasses, bearing labels indicating time of voiding*
- (14) Urinary tuberculosis is secondary to tuberculosis elsewhere in the body, pulmonary lesions are found in over 50% of cases
- (15) *Within 24 hours or even less of a severe injury to the kidney, considerable meteorism is usual due to associated bruising of the colon*
- (16) Nephrectomy is necessary in majority of those cases of kidney trauma which are severe enough to merit urgent exploration
- (17) *Treatment of*
 - (1) *Hyperemesis gravidarum*
 - (2) *Eclampsia*
 - (3) *Pregnancy pyelitis*
 is (a) *Ureteral catheterisation*
 + (b) *Continuous intravenous sod sulph*
- (18) Etiology of female pyelitis
 - (A) Pregnancy upper urinary stasis
 - (B) Puerperium lower urinary stasis
- (19) Tuberculous kidney
 - (a) Frequent micturition
 - (b) Painless hæmaturia or dysuria
 - (c) Pyuria
- (20) *Most common causes of anuria*
 - (a) *Impacted calculus*
 - (b) *Urinary operation*
 - (c) *Sudden relief of acute retention*
 - (d) *Pregnancy with eclampsia*
 - (e) *Pelvic carcinoma*
 - (f) *Bilateral ureteral trauma in hysterectomy*
- (21) Calculous anuria is complete suppression of urine directly or indirectly due to a calculus
- (22) Diaphoretics are useless and even harmful in anuria, what the patient requires is a diuretic
- (23) In 99 out of 100 cases where a kidney is the only organ damaged the rupture is extraperitoneal and lumbar exposure is advisable
- (24) *Congenital absence of one kidney occurs sufficiently frequently to make it imperative to ascertain the presence of second organ before a nephrectomy*

- (25) Methods of finding of a second healthy kidney :
 - (a) External palpation under anæsthesia
 - (b) *Excretion pyelography*
 - (c) Chromo cystoscopy
 - (d) Trans abdominal intraperitoneal palpation
- (26) First nephrolithotomy was done in 1889 by Sir Henry Morris on a domestic servant
- (27) Three routes of kidney infection
 - (a) Descending hæmatogenous
 - (b) Ascending urinary
 - (c) Infiltrating from neighbours.
- (28) *Very high temp out of all proportions to the pulse in*
 - (a) *A child*
 - (b) *Pregnant woman*
 - (c) *Lower urinary focus*
 - (d) *Distant pyogenic focus*
? *Pyelitis or pyelonephritis*
- (29) In renal infections
 - (a) Acid urine
 - (a) *B coli*
 - (β) *Streptococcus*
 - (b) Alkaline urine
 - (a) *Staphylococcus*
 - (β) *B proteus*
- (30) Hæmatogenous or primary chronic pyelonephritis is commonly unilateral but reverse applies to ascending or secondary variety, which, in the majority of cases, is bilateral
- (31) Dysuria, hæmaturia or costo vertebral pain in pregnancy with pyuria diagnose pregnancy pyelitis.
- (32) *Coli bacilluria in pregnancy has been found in 90% of cases.*
- (33) Combination of urinary stagnation and infection is responsible for high incidence of pyelonephritis during pregnancy or puerperium
- (34) Pyelonephritis of puerperium is always secondary to pyelonephritis of pregnancy
- (35) *Do not wait for fluctuation in perinephric abscess, explore as soon as the condition is strongly suspected*
- (36) When a kidney is removed, atrophy of the first interspace of the hand between the thumb and the index finger on the same side takes place (Med Ann 1939)
- (37) Preliminary nephrostomy saves many a life in pyonephrosis
- (38) Etiology of perinephric abscess
 - (a) Renal
 - (b) Perirenal

- (c) Regional surrounding organs
 - (d) Distant pyæmic
 - (a) Pyococcal
 - (β) Tuberculous.
- (39) *No instrumentation should be done in any case of acute urinary tract infection or inflammation*
- (40) Instrumentation or operative interference in a case of chronic lower urinary tract infection, may light up acute ascending pyelonephritis
- (41) Nephrectomy is not indicated in ascending pyelonephritis, as it is commonly or potentially bilateral
- (42) In cases of advanced urinary obstruction with or without infection, treatment should be in stages
- (a) Drainage + antiseptics
 - (α) Medical
 - (1) Fluids
 - (2) Diuretics
 - (3) Urinary antiseptics
 - + (β) Catheter
 - (1) Urethral
 - (2) Ureteral
 - ↓ (b) Bladder lavage
 - ↓ (c) Operative interference
- (43) *Routine bacteriological examination of the urine constitutes a most important part of ante natal care and should never be omitted*
- (44) Later in pregnancy the pyelonephritis develops, the worse is the prognosis
- (45) *Blood transfusion is dangerous in the presence of damaged renal epithelium*
- (46) *Pyelitis in infants*
- (A) *Acidification for three days*
 - (a) *Lactic acid 5 gm for each year of age*
 - or (β) *Phosphoric acid 2 m for each year of age*
 - ↓ (B) *Alkalinisation for three days*
Soda bi carb
- (47) Pyelitis of pregnancy begins at the sixth week in multiparæ and tenth week in primiparæ reaching its maximum in fifth month, it disappears slowly after delivery
- (48) *As a preventive of pyelitis, the importance of high fluid intake during pregnancy cannot be over estimated*
- (49) *Costo vertebral spasm and tenderness is of great diagnostic value in perinephric abscess*
- (50) *Acute retrocæcal appendicitis and acute pyelitis simulate each other very closely*

- (51) Absence of pus in urine within 12 hours of the onset of acute crisis makes the diagnosis of acute pyelitis improbable
- (52) Indications for renal sympathectomy
 - (a) Nephralgia renal pain with no organic lesion
 - (b) Small painful hydronephrosis
 - (c) Essential hæmaturia
 - (d) Recurrent stones
 - (e) Renal hyperpiesia
- (53) Renal tuberculosis starts as
 - (a) Pyelonephritis
 - or (b) Renal abscess
- (54) *Kidney receives 300-450 ccs of blood per minute. All blood in the body passes through the kidneys in a little over 10 minutes*
- (55) *First symptom of renal tuberculosis is diurnal frequency*
- (56) If pus is present in acid urine with sterile culture, T B kidney should be suspected
- (57) It is advantageous to both mother and child to remove a T. B kidney in early months of pregnancy
- (58) Operations of kidney are well borne by pregnant women
- (59) Chief signs of T B kidney
 - (a) Frequency
 - (b) Dysuria
 - (c) Changes in urine
- (60) *Pyuria, sterile and acid, is strongly suggestive of tuberculous kidney*
- (61) *It is unwise to catheterise the ureter on the affected side in tuberculous kidney because of the dangers of severe constitutional disturbance and secondary infection*
- (62) In tuberculous kidney, urine examination :
 - (a) Microscopic positive in 72%
 - (b) Guinea pig test positive in 94%
 - (c) Culture positive in 98%
- (63) Children with relapsing pyelitis and persistent pyuria may be suffering from tuberculous kidney
- (64) In tuberculous kidney and bladder, no lavage is advisable
- (65) No blood should be allowed to escape into the wound from the renal end of the renal vein in nephrectomy for T B or malignancy, as such blood may contain T B bacilli or malignant cells respectively.
- (66) X Ray pictures in urinary stones
 - (a) Best shadows cystin stones
 - (b) Good shadows calcium oxalate

- (c) Fair shadows
 - (a) Calcium phosphate
 - (β) Triple phosphates
- (d) No shadows
 - (a) Uric acid
 - (β) Ammonium and sodium urate
- (67) Negative shadow in a pyelogram
 - (a) Uric acid stone
 - (β) Urates stone
- (68) Cardinal symptoms of urinary stones
 - (a) Pain
 - (b) Hæmaturia
 - (c) Effect of movements and rest
- (69) Renal colic
 - Characters
 - (a) Abrupt start and end
 - (b) Intermittency
 - (c) Shooting in a certain direction
 - Clinic
 - (1) Pain
 - (2) Vomiting
 - (3) Shock
 - (4) Restlessness
 - (5) Dysuria
 - (6) Effect of atropine
- (70) 50 % of the renal colic cases are due to calculus, the remainder being due to infection a few being due to blood clot or mobile kidney
- (71) In kidney stones restrict the proteins but give milk and butter freely
- (72) In cases of bilateral kidney stones or all cases of metabolic stones where there is likelihood of affection of the other kidney be conservative as regards nephrectomy, especially if the patient is young
- (73) New growths of the kidney of sufficient size to be detectable clinically are malignant
- (74) Age for renal malignancy
 - (a) Infants under 4
 - (b) Adults over 40
- (75) All growths of the renal pelvis must be regarded as malignant
- (76) The classical triad of renal tumours
 - (a) Hæmaturia 63%
 - (b) Renal tumour 53%
 - (c) Pain 20%
- (77) Retrograde pyelogram is very useful in the diagnosis of renal tumours
- (78) Begg's sign in renal malignancy Med Ann. 1940 Engorge ment of a vein from anterior superior iliac spine towards umbilicus or at the outer border of the rectus

- (79) In one out of three cases of Grawitz tumour, growth extends into the main renal vein
- (80) Before a patient is classified as suffering from hypertension of unknown origin, he should have a complete urological examination
- (81) *Prostatic enlargement, chronic pyelonephritis, and renal calculus head the list of urological causes of hypertension*
- (82) *Renal malignancy*
 - (A) *Grawitz*
 - (a) *Hæmaturia*
 - (b) *Renal tumour*
 - (c) *Varicocele*
 - (d) *Age over 40*
 - (B) *Wilms*
 - (a) *Irregular large tumour*
 - (b) *Cachexia*
 - (c) *Age below 4*
- (83) Hypernephroma constitutes over three fourths of malignant renal tumours, is seen in adults over 40, and is relatively most innocent of malignant renal tumours
- (84) *Classical symptoms of renal malignancy*
 - (a) *Profuse, painless, periodic hæmaturia*
 - (b) *Renal tumour*
 - (c) *Age*
 - (a) *Below 4*
 - (b) *Above 40*
- (85) Painless hæmaturia or onset of varicocele after adult age, must be fully investigated as early as possible to exclude renal malignancy
- (86) *Malignant kidney rivals syphilis as the greatest mimic in clinical medicine*
 - (a) *Persistent unaccounted for pyrexia*
 - (b) *Metastases*
 - (a) *Bones*
 - (b) *Neck glands*
 - (c) *Skin*
- (87) *Intravenous mercurochrome 10 ccs of 1% sol is an excellent antipyretic in protracted pyelonephritis*
- (88) *In every operation for urinary stone, hang up the X Ray film near the operation table*
- (89) *Indications for urgent nephrectomy*
 - (a) *Rupture*
 - (b) *Uncontrolled hæmaturia.*

- (90) Nephrostomy tube
 (a) Local anæsthesia
 (b) Should not be tortuous
 (c) Catgut anchor to kidney capsule
 (d) Remove in 2-3 weeks
 (e) Keep urine acid
- (91) *Lower part of kidney incision should not come within two inches of the iliac crest so that there should be enough muscle left attached to it for easy suture at the time of closure*
- (92) Never attempt to haul the kidney out of the wound, deliver one pole at a time
- (93) *Administration of fluids constitutes a most important part of the after treatment of all operations on the urinary system*
- (94) *On no account should purgatives be given by mouth until a natural or enema action is obtained*
- (95) Chief avenues of renal infection
 (a) Hæmatogenous septicæmia
 (b) Ascending lower genito urinary focus
 (c) Local calculus
 (d) Intestines B coli
- (96) *Special renal examinations*
 (a) *Urine examination*
 (α) Chemical
 (β) Microscopical
 (γ) Cultural
 (b) *Cystoscopy*
 (α) Ordinary
 (β) Uretal catheterisation
 (γ) Chromo cystoscopy
 (δ) Instrumental pyelography
 (c) *X Rays*
 (α) Simple plate
 (β) Instrumental pyelography
 (γ) Excretion urography
 (d) *Urea tests*
 (α) Urine urea concentration
 (β) Blood urea and N P N
 (e) *Circulatory system*
 (α) Heart
 (β) Arteries
 (γ) B P
- (97) *Differential diagnosis between kidney lesions and other intraperitoneal lesions is very important from the view point of approach*

<i>Extra-peritoneal</i>	<i>Intra-peritoneal</i>
Kidney and ureter	Appendix and cæcum
Spine	Liver and gall bladder
Ribs	Pylorus and duodenum
Pleura	Pancreas
Retrocæcal appendix	Ovaries
Ilium + sacro iliac joint	

- (98) *Renal tumour*
 (a) *Movable or ectopic kidney*
 (b) *Hydro or pyo nephrosis*
 (c) *Polycystic kidney*
 (d) *Malignant kidney*
 (e) *Perinephric abscess*
- (99) *Pressure signs in perinephric abscess vary with its position*
- (100) *Kidney syndrome*
 (a) *Costo vertebral pain and tenderness*
 (b) *Renal colic referred to*
 (α) *Thigh*
 (β) *Inguinal region*
 (γ) *Testis*
 (c) *Bimanual palpation*
 (d) *Urine examination*
- (101) *Pre operative treatment in renal operations*
 (a) *Urinary antiseptics and diuretics*
 (b) *Intestinal antiseptics and laxatives*
 (c) *Kidney function promoters*
 (d) *Anti acidosis treatment*
 (α) *Glucose*
 (β) *Saline*
 (γ) *Soda bi carb*
 (e) *Heart and lungs vigil*
- (102) *Avoid instrumentation in acute infective and obstructive urinary cases, except for drainage.*
- (103) *Think of pyelitis and ureteral stone in every case of appendicitis*
- (104) *Think of urinary sepsis in all pyrexias*
- (105) *Urinary fistula is diagnosed by*
 (a) *Smell*
 (b) *Dye injection*
 (c) *Chemical examination*
- (106) *Insidious cystitis in young robust person .*
 ? *Tuberculous kidney*

- (107) In tuberculosis, examine the whole genito urinary system
 - (108) *Primary genito urinary tuberculosis*
 - (a) *Kidney*
 - (b) *Prostate and seminal vesicles*
 - (c) *Testis*
 - (109) Density of shadow in X Ray film is in direct proportion to calcium content of the stone
 - (110) Bony metastases or varicocele may be the first sign of malignant kidney
 - (111) *Most common post operative complications after renal operations*
 - (a) *Anuria \rightarrow uræmia*
 - (b) *Urinary sepsis*
 - (c) *Shock*
 - (d) *Heart failure*
 - (e) *Lung inflammations*
 - (f) *Intestinal ileus*
-

CHAPTER III

THE URETER

(I) CONGENITAL MALFORMATIONS:

- (1) Duplication associated with double kidney
- (2) Bifurcation associated with double pelvis
- (3) Stricture
 - (a) Upper end

Treat (α) Ramstedt
 or (β) Transverse suture of vertical incision
 or (γ) Division of etiological band
 + (δ) Nephropexy
 - (b) Pelvic brim
 - (c) Lower end
 - (d) Where it is crossed by uterine vessels in females
- (4) Valves
- (5) Misplacement
- (6) Diminished length } associated with ectopic kidney
- (7) Undue mobility + kink associated with mobile kidney
- (8) Pinhole ureteric orifice with ureterocele

Treat by catheteral dilatation

Complications are (a) Renal dilatation
 (b) Renal infection
- (9) Ectopic ureteral orifice

Sites (a) Prostatic urethra
 (b) Seminal vesicles
 (c) Vas deferens
 (d) Ejaculatory ducts
 (e) Vestibule
 (f) Urethra
 (g) Vagina
 (h) Uterus

Clinic (1) Dribbling urine
 (2) Urinary obstruction syndrome
 (3) Urinary infection syndrome

Sign (1) Cystoscopy
 (2) Pyelography

Compl (a) Urinary obstruction
 (b) Urinary infection

(II) URETERAL TRAUMA:

(1) ACCIDENTAL

- Etio (A) Subcutaneous
- (α) Fracture pelvis or vertebral process
 - (β) Laceration of kidney
- (B) Penetrating
- Stab wounds

- Clinic:** (a) Shock
 (b) Extravasation of urine in the loins
 + (c) Ohguria
- Treat:** (1) Exploration
 ↓ (A) Ureteric catheter in situ for 3 days
 + Peri ureteral cellular drainage
 or (B) Anastomosis over ureteral catheter
 or (C) Ligature upper end
 or (D) Nephrectomy with ligature lower end

(2) OPERATIVE:

- Etio:** (a) **Hysterectomy**
 (b) Forceps delivery
- Path:** (a) **Section**
 (b) **Ligature**
- Compl:** (1) **Urinary extravasation:**
 (a) Peritoneal
 (β) Extraperitoneal
- (2) **Anuria with uræmia:**
 : If injury to both ureters
- (3) **Urinary fistulæ.**
 : Internal or external
- Sequelæ:** (a) **Stricture ureter**
 ↓ (b) **Renal complications:**
 (a) Atrophy
 (β) Hydronephrosis
 (γ) Infection
- Treat:** (A) **Prophylactic:**
 : Preliminary ureteral catheters
- (B) **Immediate during operation:**
 (a) **Partial injury**
 : Peri ureteral drainage
 (b) **Complete injury**
 (1) End to end anastomosis
 or (2) Implantation of upper end.
 (a) Bladder
 (β) Sigmoid
 (γ) Loin
 or (3) Ligature + nephrectomy
 + (4) Peri ureteral drainage
- (C) **Immediate post-operative:**
 (a) **Anuria after hysterectomy:**
Path: Bilateral ligature
Treat: Bilateral nephrostomy
 (b) **Urinary fistulæ after pelvic oper.:**
Treat: Exploration

(D) Remote :

- (a) Dilatation by ureteric catheters
- (b) Implantation of upper ureter
- (c) Anastomosis
- (d) Nephrectomy

Post treat Intermittent ureteral catheterisation

(III) URETERAL OBSTRUCTION :

Etio (A) UNILATERAL URETERAL OBSTRUCT

(1) Wall :

- (a) Valves, folds congenital
- (b) *Stricture* congenital
acquired

(2) Lumen :

- (a) Impacted *calculus*
- (b) Blood clot, pus or debris

(3) External pressure :

- (a) Tumours
Pregnant uterus
Fibroids
Ovarian cysts
- (b) Bands
- (c) Aberrant renal vessels
- (d) Abscesses psoas, perinephric
- (4) Implication in malignancy :
 - (a) Uterus
 - (b) Rectum
 - (c) Bladder

(5) Kinking or torsion :

Associated with mobile kidney

(6) Trauma Operative

(B) BILATERAL URETERAL OBSTRUCT

(1) Lower urinary obstruction :

- (a) Bladder
- (b) Urethra

(2) Implication in pelvic malignancy

(3) Trauma in pelvic operations :

- (a) Section
- (b) Ligature

Pathology : (1) Obstruction
 ↓ (2) Proximal dilatation
 ↓ (3) Proximal stagnation
 ± (4) Proximal infection
 or (5) Proximal atrophy

Clinical syndrome

- (1) Acute and complete bilateral obstruction
 : Acute suppression of urine → uræmia

- (2) Acute and incomplete obstruction :
: **Acute renal colic**
- (3) Chronic complete obstruction :
: Atrophy of the kidney
: **Chronic kidney failure** → uræmia
- (4) Chronic incomplete obstruction :
: **Hydro-ureter and hydronephrosis**
- (5) Acute or chronic recurrent obstruction :
: **Recurrent colic with hydronephrosis**

- Compl. : (1) **Suppression of urine** → uræmia : -
 (a) Acute
 (b) Chronic
- (2) **Proximal dilatation with stagnation**
 - (3) **Urinary infection**
 - (4) **Urinary lithiasis**

- Treatment. (A) **Renal colic** (See page 1642)
 (B) **Operative**
 (a) **Drainage**
 (b) **Removal of etiology**

(IV) URETERAL STRICTURE:

- Etio. (A) **Congenital**
 (a) **Pelvi ureteral junction**
 (b) **Ureteric orifice**
 · **Pin hole orifice with ureterocele**
- (B) **Acquired**
 (a) **Traumatic**
 (b) **Calculus impaction**
 (c) **Implication in a growth**
 (d) **Secondary to genital sepsis**

- Clinic : **Back pressure :**
 (a) **Atrophy of the kidney**
 or (b) **Hydronephrosis**

- Compl : **Infection :**
 (a) **Pyelitis**
 (b) **Pyelonephritis**
 (c) **Pyonephrosis**

- Treat. (A) **Pin-hole orifice :**
 (a) **Intermittent dilatation by a bougie**
 (b) **Ureteric meatotomy : cystoscopic**
- (B) **Stricture ureter :**
 (a) **Bougie dilatation**
 (b) **Plastic operation :**
 (1) **Extraperitoneal exposure**
 ↓ (2) **Vertical slit**
 ↓ (3) **Passage of a catheter**

- ↓ (4) Transverse suture
 ↓ (5) Tie in the catheter for 3 days

(C) Pelvi ureteral stricture :

- (a) Removal of primary genital sepsis
 + (b) Intermittent bougie dilatation
 or (c) Plastic operation

After treat Intermittent bougie dilatation

(V) URETEROCELE :

Def A cystic dilatation of the intramural part of the ureter
 Due to prolapse of one or more of its coats

Etio Pin hole ureteric orifice

Types (1) Mucous prolapse of the muc. mem.
 (2) Muscular

Clinic (1) Upper urinary obstruction
 (a) Hydronephrosis
 (b) Hydro ureter

(2) Cystoscopy
 Cystic swelling round about the ureteric orifice which
 resembles a nipple of the breast

Compl (1) Infection
 (2) Calculus

Treat Cystoscopic meatotomy

(VI) TUBERCULOUS URETER

Etio Secondary to tuberculous kidney

Clinic (1) Tender cord like ureter
 (a) Abdominal palpation
 (b) P R or P V
 (2) Abnormal urine
 Acid sterile pyuria
 (3) Cystoscopy Golf hole orifice
 (4) Intravenous pyelography
 (a) Narrowing of lowest 1" of ureter
 + (b) Slight dilatation above
 ↓ (c) Thickening + dilatation + irregularity
 + (d) Tuberculous kidney

Treat Nephrectomy + excision of the ureter

(VII) URETERAL CALCULUS :

Etio Middle aged males on either side
 Stones in renal pelvis

Path (a) *Types*
 (1) Calcium oxalate aseptic urine
 (2) Calcium phosph infected urine
 (b) *Shape*
 Ovoid elongated
 (c) *Sites*
 (a) Pelvi ureteral junction

(β) Ureteric orifice

(γ) Pelvic brim

Compl : (1) **Impaction :**(α) **Calculous anuria**(b) **Proximal obstruction :**

(α) Chronic suppression

(β) Hydronephrosis and hydro ureter

(2) **Infection :**

(α) Pyelitis

(β) Pyelonephritis

(γ) Pyonephrosis

(δ) Peri ureteritis

(3) **Urinary fistulæ**(4) **Stricture**Clinic (A) *Non impacted stone*

: Renal colic with varying levels

Pain referred to (α) Loin

(β) Inguinal canal

(γ) Penile root

(δ) Groin & testis

(B) *Impacted stone*(α) **History of previous colics**(b) **Constant pain :**

(α) Costo renal angle

(β) Tip of 9th rib

(γ) Outer border of rectus

(δ) Penile tip

(c) **Tenderness :**

1" down and in to McBurney

(d) **Renal back pressure :**

(α) Pain

(β) Tenderness

(γ) Spasm

(e) **Reflex signs :**

(α) Genital irritation

(β) Rectal irritation

(γ) Bladder irritation

(δ) Psoas irritation

(f) **Micturition :**

• Dysuria + strangury

(g) **Urine :**

(α) Hæmaturia

(β) Crystalluria

(γ) Pyuria

Signs : (1) **Palpation** : Tenderness, rigidity, stone

(a) Abdominal

(b) P. R.

(c) P. V.

(2) **Cystoscopy** :

(a) Ureteric orifice : inflamed

(b) Efflux : abnormal

. Blood stained

. Cloudy

(c) Ureteric catheterisation :

(a) Obstruction

(β) Grating

(γ) Relief of proximal tension

(δ) Ascending pyelogram

(3) **Radiography** :

(a) *Plain* . shadow in the line of ureter

Diagnose from (a) Calcareous material

(β) Phlebolith

(b) Opaque catheter bougie

(c) Ascending pyelography

(d) *Intravenous pyelography*

(4) **Kidney function tests**

Diff diag. (1) **Pyelitis or pyelonephritis**

(2) **Appendicitis**

(3) **Salpingitis**

(4) **Cystitis**

(5) **Psoasitis or psoas irritation**

Treat : Factors in treatment :

(A) **Size** :

(a) Small passable expectant

(b) Small impacted : cystoscopic

(c) Large impacted . operative

(B) **Site** :

(a) Lower part : cystoscopic removal

(b) Upper part : cysto-copic trial

↓ operative removal

(C) **Time** :

(a) Recent : expectant

(b) Upto 8 weeks . cystoscopic removal

(c) After 8 weeks . operative removal

(D) **Kidney condition** :

(a) Good : expectant

(b) Moderate : cystoscopic

(c) Bad : operative

(E) **Skill of the surgeon**

(F) **Tolerance of the patient**

(i) *Expectant treatment :*

- Ind : (a) Small passable stone : Not more than 10 m.m.
 (b) Recent impaction
 (c) Previous history of passing stone
- Contra : (a) Back pressure
 (b) Lower urinary obstruction
 (c) Urinary infection
 (d) Diseased kidney
- Tech : (A) **By mouth :**
 (a) Hydrotherapy
 (b) Diuretics
 (c) Urinary antiseptics
 (d) Chemical opponents.
 (α) Acids . acid ammon phosph.
 (β) Alkalies soda-bi carb
 (e) **Syntropan :**
 : One tablet every 4 hours for 16 hours
 (f) Glycerine
 : 50 gs. T. D. S for 3 days
- (B) **Subcutaneous :**
 : Papaverine $\frac{1}{2}$ gr.
- (C) **Rectal : (For pain)**
 : R Sodium bromide drachm 1
 Chloral hydras grs 30
 Tr. opium m. 6
 Warm starch water ounces 5
- (D) **X Rays :**
 : Series taken at intervals to mark the progress of the stone and evidence of back pressure on the kidneys

(ii) *Instrumental treatment :*

- Ind : (a) Good kidney
 (b) Lower third of ureter
- Contra : (a) Bad kidney
 (b) Severe reaction
 (c) Stone > 2 cms.
- Pre treat : Omnopon $\frac{2}{3}$ gr. + scopolamine $\frac{1}{150}$ gr.
- Treat : (A) **Un impacted stone :**
 : Passage of an ureteric catheter
- (B) **Impacted stone :**
 (1) **Impaction in upper part :**
 (a) **By mouth :**
 (α) Syntropan :
 : One tablet every 4 hours
 (β) Glycerine :
 : 50 gs T. D. S. for 3 days

↓ (b) **Dilatation of ureter :**

- (α) Ureteral catheters & bougies
- (β) Buerger's dilating olives
- (γ) Ureteric dilators
- (δ) Jolly's hydrostatic dilators

↓ (c) **Injection of drugs in ureter :**

- (a) Passage of ureteric catheter
- ↓ (β) Ureteral injections of
 - (1) Lubricants
: Olive oil : 5 c cs.
 - (2) Anæsthetics + antispasmodics
 - (α) Papaverine 5%
In 5 c.cs olive oil
 - (β) 2% cocaine + soda bicarb
In distilled water
 - (γ) 2% novocain
 - (3) Antiseptics + dislodgers
 - (α) Acriflavine 1 in 2000
 - (β) Hg oxycyanide 1 in 4000
 - (γ) Silver nitrate : 1 in 4000

(2) *Impaction in lower part*

- (a) Cystoscopic scissors
- (b) Diathermy :
 - (α) Coagulating
 - (β) Cutting
- (c) Dilatation + injection (See above)

(iii) *Operative treatment*

- Ind
- (1) Calculus anuria
 - (2) Renal dilatation
 - (3) Renal infection
 - (4) Failure of conservatism
 - (5) Conservatism contraindicated

Tech · (A) *Kidney recoverable*
: Uretero-lithotomy :

- (a) Higher
 - (b) Vaginal
- Ind Obese female patient

(B) *Kidney non recoverable*
: Nephrectomy + (or →) uretero-lithotomy

(VIII) TUMOURS OF THE URETER :

(A) *Primary* very rare

- (1) Papillomata
- Etio Secondary to pelvic papillomata

- Compl
- (a) Spread downwards
 - (b) Ureteral colic and obstruction
 - (c) Urinary hæmorrhage
 - (d) Carcinomatous metaplasia

(2) **Carcinomata:**

Etiology: Papillomata

(B) *Secondary:*

Etiology. Carcinoma of. (a) Uterus
 (b) Bladder
 (c) Rectum
 (d) Colon
 (e) Prostate

Complications (a) Urinary obstruction
 (b) Urinary infection
 (c) Urinary fistulae

Treat. Removal of primary growth

With: (a) Kidney
 (b) Ureter
 (c) Ureteric orifice

(IX) OPERATIONS ON URETER:**(1) EXTRAPERITONEAL EXPLORATION:****(A) Abdominal segment.**

- (a) **Lumbar kidney incision**
- (b) **Rectus incision:**
 - (α) Incision internal to linea semilunaris
 - (β) Rectus sheath and muscle split
 - (γ) Incision of transversalis fascia
 - (δ) Separation of peritoneum

(B) Brim and pelvic segment

- (a) **Median subumbilical incision:**
: Steps as in rectus incision
- (b) **Iliac incision:**
: Ant. sup iliac spine to mid Poupart
- (c) **Trans-vesical route:**

Tech. (α) Suprapubic cystotomy
 or (β) Cystoscopy

Ind: Calculus in the lowest part

Post oper: **Drainage of peri-ureteral cellular tissues**

Difficulties: (a) Adhesions
 (b) Abnormal size
 (c) Haemorrhage

(2) URETERO-LITHOTOMY.

- (a) Ureteral exposure
- (b) Ureteral isolation
- (c) Ureteral incision:
: In healthy proximal part
- (d) Calculus displacement and extraction
- (e) Passage down of an ureteral bougie
- (f) Ureteral suture: not necessary
- (g) Peri ureteral drainage

(3) URETERECTOMY

- Ind** (1) T B kidney and ureter
 (2) Advanced hydro or pyo ureter
 (3) Growths papillary pelvic tumours
 (4) Hydro nephro ureter
- Time** (a) Primary in association with nephrectomy
 (b) Secondary 6 months after nephrectomy
- Tech** (a) Exposure isolation and withdrawal of kidney
 From lumbar incision
 (b) Exposure and isolation of lower ureter
 Through median or iliac incision
 (c) Ligature division and carboli at on
 Of lower ureteral end near the bladder
 (d) Withdrawal out of lumbar wound
 Of kidney and separated ureter
 (e) Drainage tubes
 (a) Lumbar
 (β) Perivesical

(4) URETERO URETERAL ANASTOMOSIS

- Ind** (a) Traumatic division
 (b) Traumatic rupture
 (c) Stricture
 (d) Growth
- Tech** End to-end oblique
 (a) Extraperitoneal exposure
 (a) Iliac
 or (β) Midline
 (b) Excision of affected part
 (c) Oblique cut of both ends
 (d) Ureteric catheterisation
 (e) Interrupted submucous sutures
 (f) Drainage
- Post treat** (1) Removal of ureteric catheter
 On fourth day
 (2) Intermittent ureteral dilatation
 By bougies or catheters
 (3) Pyelogram checks
- Post-compl** Stricture
 Urinary fistula

(5) TRANSPLANTATION OF URETER

- Ind** (A) Bladder
 (a) Congenital malformations
 Ectopia vesicæ
 (b) Malignant growths
- (B) Ureter
 (a) Congenital conditions
 (b) Trauma lower pelvic part
 (c) Stricture
 (d) New growths

Tech *Transplantation into*(A) *Bladder*

- Ind (a) Post-operative ureteral fistula in pelvis
 (b) During partial cystectomy

- Tech (a) Lavage and distension of bladder
 (b) Median suprapubic incision
 (c) Extraperitoneal exposure
 Of bladder and pelvic ureter
 (d) Division and isolation of ureter
 Above the obstruction
 (e) 1/2" split of upper open end of ureter
 (f) Anchor suture through each edge

↓ (1) Closed method

- (a) Puncture of bladder
 At the site of transplant
 (b) Carrying anchor stitches
 In and out of bladder
 (c) Peri vesical drainage
 For seven days
 (d) Urethral drainage
 For ten days

or (2) Open method

- (a) Suprapubic cystotomy
 (b) Puncture from inside out
 (c) Steps as in (1)
 (d) Suprapubic cystostomy
 For ten days
 (e) Perivesical drain
 For seven days

(B) *Intestine*

- Ind (a) Ectopia vesicæ
 (b) Cystectomy
 (c) Vesico vaginal fistula
 (d) Exclusion of bladder
 T B or growth

Tech (1) *Stiles*

Ureter infolded in wall by sutures

(2) *Colley*

Ureter submucous before opening into the lumen

(3) *Maydl*

Implantation of ureter with trigone into sigmoid

(4) *Winsbury White*

Syn Two-stage submucous

Tech (A) *First stage*

- (1) Subumbilical median laparotomy
 (2) Peritoneal incision
 (3) Ureteral isolation
 (4) Peritoneal suture

- (5) Incision into peritoneo-muscular coat of pelvic colon
- (6) Submucous fixation of ureter
- (7) Closure
- ↓ (B) Interval 2-3 weeks
- ↓ (C) Second stage
 - (1) Laparotomy
 - (2) Division of ureter
 - Below its intramural position
 - (3) Ligation of distal end
 - (4) Transfixation of proximal end
 - (5) Opening the colon
 - Just below the uretero bowel junction
 - (6) Fixation of open ureteral end
 - Within the bowel lumen
 - (7) Double closure of bowel opening
 - (8) Pericellular drainage
 - (9) Closure
- (Same technique on other side)
- Site For implantation
 - (a) 3" from recto vesical pouch
 - (b) Sigmoid flexure
- (C) *Skin*
- Syn Cutaneous ureterostomy
- Ind (a) Intractable tuberculous cystitis
 - With pain + frequency
- (b) Preliminary to total cystectomy
- Tech (a) Incision of grid iron appendicectomy
- (b) Division of int. oblique
- (c) Division of ureter
 - Low down
- (d) Ligation of distal end
- (e) Isolation of the whole upper segment
- (f) Ureteral catheterisation
- (g) Ureter brought out of incision
 - For four cms
- (h) Closure of the wound around ureter
 - (No anchoring of ureter)
- Post-compl Slinging of distal part of ureter
- (D) *Vagina*
- Post treat (1) Intravenous soda sulph
- (2) Rectal tube to drain urine
- (3) Urinary antiseptics
- (4) Intestinal antiseptics
- Post-compl. (1) Peritonitis
- (2) Urinary obstruction
- (3) Ascending urinary infection
- (4) Incontinence
- (5) Irritation of the reservoir
- (6) Faecal and urinary fistulae

(X) IMPORTANT POINTS

- (1) *The ureteric line crosses the tips of lumbar transverse processes*
- (2) Ureteric stone should be diagnosed from
 - (a) Renal affections
 - (b) Appendicular affections
 - (c) Colon affections
 - (d) Bladder affections
 - (e) Genital affections
 - (f) Psoas affections
- (3) *Beware of ureters in gynæcologic operations*
 - (a) *Hysterectomy*
 - (b) *Broad ligament cyst*
- (4) *Most common causes of ureteric obstruction*
 - (a) *Pregnant uterus*
 - (b) *Trauma post operative*
- (5) Extra urinary shadows confused with ureteral or renal stones
 - (a) Calcified lymph glands
 - (b) Phlebolith
 - (c) Opaque intestinal contents
 - (d) Gall stones
- (6) In cases of doubt about ureteric shadow, pass an opaque ureteric catheter and take a film
- (7) Types of urinary obstruction
 - (a) Acute and complete

Cause Impacted stone
Clinic Anuria
Compl Uræmia
 - (b) Chronic and incomplete

Cause Stricture
Clinic Hydronephrosis + hydro ureter
Compl (a) Uræmia
(b) Urinary infection
- (8) *Best way of avoiding operative trauma to the ureters, is to pass ureteric bougies as a preliminary pre operative measure*
- (9) *A divided ureter pouts, a divided artery retracts*
- (10) No case of pyelitis should be considered to be satisfactorily explained until some cause of urinary obstruction within urethra bladder, ureter or renal pelvis has been demonstrated
- (11) About 70 % of ureteric calculi pass naturally
- (12) *On no account should an ureteric catheter be passed with its stylette in situ*

- (13) Majority of ureteral stones are formed in the renal pelvis and become impacted in the ureter on their way to the bladder
- (14) In ureteral colic, the site of maximum pain denotes the site of recent impaction
- (15) *Most important symptoms of back pressure are persistent renal aching and tenderness which if present, should be regarded as an indication for early operation*
- (16) *In cases of urinary stones do not overlook the etiological factor*
 - (a) Obstruction
 - (b) Infection
 - (c) Metabolism
- (17) *A rapidly increasing pulse or pulse rate over 100 is suggestive of intraperitoneal lesion*
- (18) *Examine the urine fully in every case of intra abdominal lesion, acute or chronic especially in suspected appendicitis*
- (19) Two months is the maximum period for which a stone may be allowed to remain impacted, provided there are no appreciable complications
- (20) Hæmaturia is not an uncommon complication of acute retro cæcal appendicitis
- (21) It is unnecessary to suture the ureter after uretero lithotomy
- (22) For exposure of the lower part of the ureter, median subumbilical incision is better than iliac incision
- (23) When the ureter is suddenly and completely occluded, renal function on that side ceases forthwith eventually the kidney atrophies
- (24) *Comparative calm of the patient with appendicitis is in sharp contrast with restlessness of the one in the agonies of renal colic*
- (25) *Nephrostomy is the best immediate treatment of post operative recognisance of ureteral trauma. It is best to wait for several months before attempting to repair the ureter (Med Ann 1940)*
- (26) Absence of tension is of primary importance in ureteral anastomosis operations
- (27) Indications for complete nephro ureterectomy
 - (a) Renal pelvis papillomata
 - (b) Tuberculous kidney
- (28) *It is preferable to remove the appendix of a patient with a stone in the ureter than to neglect to do so in one with acute appendicitis*
- (29) *Increased leucocytosis is in favour of appendicitis*

- (30) 70% of impacted ureteral calculi are in the pelvic portion, 1"-2" above the bladder
 - (31) Ureteric calculi are more destructive to the kidney than renal pelvis stones
 - (32) Principles to be guarded in uretero intestinal anastomosis
 - (a) Prevention of ascending infection
 - (b) Safeguarding the vitality of intra mural ureter
 - (c) Avoidance of kink or torsion
 - (33) *In ureteral transplantation, ascending infection to the kidney invariably occurs not by the ureteral lumen, but in some deeper plane*
 - (34) *Ureteral stone syndrome*
 - (a) *Entirely epigastric pain*
Always take a plain X Ray before a barium meal
 - (b) *Pseudo appendicitis*
 - (c) *Painful nocturnal emissions with hæmo spermia*
 - (d) *Classical renal colic*
-

CHAPTER IV

THE BLADDER

(1) CONGENITAL MALFORMATIONS:

(1) EXTROVERSION EXSTROPHY

Syn Ectopia vesicae

Def. Absence of anterior wall of the bladder together with lower (infra umbilical) anterior abdominal wall

Cause (a) Failure of forward growth of anterior cloacal membrane
or (b) Intra-uterine rupture of the bladder

Clinic. (1) Dark red supra pubic swelling
Exposed mucous membrane
(2) Constant leakage of urine
Through exposed ureteric openings
(3) Association with
(a) Epispadias
(b) Non-united symphysis pubis
(c) Other congenital defects

Compl (1) Urine dermatitis
(2) Ascending infection

Treat (A) Plastic operations

(1) Wood
Abdominal flap method
(2) Trendelenburg
Division of sacro-iliac joints
↓ Approximation of symphysis

or (B) Transplantation of ureters Into

(1) Urethra Sonnenburg
(2) Intestines
Coffey Into the rectum
(a) Stiles modification
(b) Grey Turner's modification
(c) Winsbury White's modification

(3) Vagina

(4) Skin cutaneous ureterostomy

or (C) Transplantation of the bladder

(1) Frank anastomosis of bladder & rectum
(2) Maydl trigone into pelvic colon
(3) Moynihan whole bladder into rectum

or (D) Bilateral nephrostomy

+ Excision of the bladder

+ Closure of the gap

↓ Permanent urinals

Time to operate . 7-10 years

Post. compl (a) Peritonitis

(b) Faecal or urinary fistula

- (c) Proctitis
- (d) Ascending urinary infection
- (e) Sloughing of the ureter

(2) VESICAL SPHINCTER STENOSIS

Syn Congenital bladder neck obstruction

Eti (1) Neuro muscular inco ordination
(2) Mechanical bars, folds, valves

Clinic (1) Difficult micturition
From birth

+ (2) No obstruction to catheter

Compl (a) Obstruction (α) Proximal dilatation
(β) Uræmia

(b) *Ascending infection*

Treat Retrograde catheterisation

(3) URACHAL MALFORMATIONS

(A) Developmental

Non-descent and retarded closure of the bladder

(B) Cysts

(C) Diverticulum at the lower end

(D) Tumours (a) Adenomata
(b) Carcinomata

(E) Fistula Patent urachus

Eti Old age enlarged prostate

Cause Urethral obstruction prostate or stricture

Clinic Umbilical urinary fistula

Treat (a) Removal of the cause

+ (b) Excision of the patent urachus

(4) CONGENITAL VESICAL DIVERTICULA

(5) CONGENITAL VESICO INTESTINAL FISTULA

Imperforate anus with rectum opening into bladder

(II) TRAUMA :

(1) RUPTURE OF THE BLADDER

Eti (a) **External violence :** Kick or blow

(α) Distended bladder

(β) Unguarded abdominal wall

(b) **Internal violence :**

(α) Catheterisation

(β) Litholapaxy

(c) **Fracture pelvis**

(d) **Operative trauma :**

(α) Blind supra pubic drainage

(β) Herniotomy

(e) **Spontaneous rupture :**
: Difficult labour

Predis (1) Intoxicated subject

(2) Distended bladder

- Path (A) Extraperitoneal: 20%**
 Deep pelvic extravasation of urine
 ↓ Pelvic cellulitis
- (B) Intraperitoneal: 80%**
 Pelvic peritoneal extravasation
 ↓ Pelvic peritonitis
- (C) Intra + extra-peritoneal**
- Clinic** (1) History of trauma
 (2) Shock
 (3) Strangury
 (4) Empty bladder
 (5) **Catheterisation test:**
- Signs** (a) Easy catheterisation
 (b) Draws little and blood stained urine
- Tech** (a) Pass catheter
 (b) *Fowler's position*
 (c) Introduce 12 oz of sterile saline
 (d) Withdraw
- Result** If less than introduced quantity
 Rupture bladder
- (6) Excretory urography**
- Late signs (A) Intraperitoneal extravasation:**
 Pelvic peritonitis
- (B) Extraperitoneal extravasation:**
 Suprapubic boggy swelling
 (a) Deep to the symphysis
 ↓ (b) Deep to abdominal muscles
- Compl** (1) Intraperitoneal extravasation
Local Pelvic peritonitis
General Toxæmia
- (2) Extraperitoneal extravasation.**
Local Suprapubic cellulitis
 ↓ Abdominal wall gangrene
 ↓ Urinary fistulæ
- General** Septicæmia
- (3) General complications**
 (a) Septicæmia
 (b) Uræmia
- Diff diag. (A) Catheterisation difficult: Rupture urethra**
 (1) Rupture anterior urethra.
 (a) Distended bladder
 (b) Superficial extravasation
 (2) Rupture posterior urethra:
 (a) Distended bladder
 (b) Deep extravasation

(B) Catheterisation easy : Rupture bladder**(1) Extraperitoneal rupture bladder :**

- (a) Empty bladder
- (b) Deep extravasation

(2) Intraperitoneal rupture bladder :

- (a) Empty bladder
- (b) Free fluid in peritoneum

(A) Distended bladder : Rupture urethra**(1) Rupture anterior urethra**

- (a) Catheterisation difficult
- (b) Superficial extravasation

(2) Rupture posterior urethra .

- (a) Catheterisation difficult
- (b) Deep extravasation

(B) Empty bladder : Rupture bladder**(1) Extraperitoneal rupture bladder .**

- (a) Catheterisation easy
- (b) Deep extravasation

(2) Intraperitoneal rupture bladder

- (a) Catheterisation easy
- (b) Pelvic peritonitis

(A) Superficial extravasation : Ante symphy.

: Rupture anterior urethra

- (a) Distended bladder
- (b) Difficult catheterisation

(B) Deep extravasation : Retro symphysis**(1) Rupture posterior urethra .**

- (a) Distended bladder
- (b) Difficult catheterisation

(2) Extraperitoneal rupture bladder :

- (a) Empty bladder
- (b) Easy catheterisation

(C) Peritoneal extravasation :

: Intraperitoneal rupture bladder :

- (a) Empty bladder
- (b) Easy catheterisation

Treat : Catheterise every suspected case in operation theatre, prepared for cystostomy

(A) Intraperitoneal rupture :

- Tech** - (a) Sub umbilical paramedian incision
 (b) Peritoneal incision and toilet
 (c) Low Fowler's position
 (d) Exposure of Retzius
 (e) Suprapubic cystostomy
 (f) Interrupted suture of rupture

- (g) Suprapubic bladder drain :
3/4" bore tube
- (h) Peritoneal toilet and closure
 - (α) Without drain
 - (β) With drain
- (i) Retzius drain
- (β) Extraperitoneal rupture :
 - Tech (a) Suprapubic cystostomy
 - (b) Retzius drain
 - (c) Indwelling urethral catheter
- (C) Operative bladder trauma :
 - Tech (a) Two layers suture
 - (b) Self retaining catheter 10 days
- Post. oper (1) Diuretics and urinary antiseptics
- (2) Removal of drains
 - (a) Retzius 3 days
 - (b) Peritoneal 3 days
 - (c) Bladder 7-10 days
 - (d) Urethral 10 days

(2) WOUNDS OF THE BLADDER

- Etio (a) Accidental
- (b) Operative
 - (α) Blind suprapubic drainage
 - (β) Herniotomy
- Predis (1) Distended bladder in suprapubic drain
- (2) Empty unrecognised bladder
In herniotomies
- Clinic Escape of urine from the wound
- Treat (a) Closure two layers suture
- (b) Urethral self retaining drain 10 days
- (c) Incision drain 3 days

(3) FOREIGN BODIES IN BLADDER

- Etio (a) Females sexual aberration
- (b) Males (α) Broken catheters
- (β) Sexual aberration
- Clinic (a) History
- (b) Cystitis or calculus syndrome
- Compl (1) Cystitis
- (2) Calculus
- (3) Perforation bladder
- Diag Cystoscopy
- Treat (A) Removal
 - (a) Urethral cystoscopic
 - (b) Suprapubic
- ↓ (B) Drainage bladder
 - (a) Urethral indwelling catheter
 - (b) Suprapubic

(III) INFLAMMATION :**(1) NON SPECIFIC CYSTITIS**

Def Inflammation of the urinary bladder •

(a) Non bacterial irritative

(b) Bacterial infective

Sources (1) **Kidney :** Descending

(2) **Urethra :** Ascending

(3) **Local :** Calculus or growth

(4) **Regional :**

(a) Lymphatic

(α) *Genital focus*

(β) *Intestines*

(b) Direct

(α) Through internal fistulæ

(β) Through external fistulæ

(5) **Hæmatogenous**

Distant focus

(A) **Urinary sources :**

(a) Kidney

(b) Urethra

(c) Local

(B) **Extra-urinary sources :**

(a) Genital focus

(b) Intestines

Routes (1) **Lumen :**

(a) Descending kidney → ureter →

(b) Ascending urethra →

(2) **Lymphatic :**

(a) Cervix erosion

(b) Intestines B coli

(3) **Blood :** Hæmatogenous

(4) **Fistulæ :**

(a) External suprapubic

(b) Internal vesico intestinal

Predisp (1) **Obstruction** → stagnation

(a) Mechanical

(b) Paralytic

(2) **Irritation** • Calculus

(3) **Chemical reaction :**

(a) Acid B coli, T B

(b) Alkaline pyococci

(4) **Reflex congestion :**

(a) Prostatitis

(b) Proctitis

(c) Appendicitis

- (5) **Trauma** Retained hæmorrhage or F B
 (6) **New growths**
- Bacterio** (A) **Acid urine**
 (a) B coli
 (b) T B
 (B) **Neutral urine**
 (a) Gonococcus
 (b) B coli
 (c) Streptococcus
 (C) **Alkaline urine**
 (a) Staphylococcus
 (b) B proteus
- Etio types** (A) *Primary cystitis*
 (a) Obstruction → stagnation
 (b) Irritation → inflammation
 (c) Infection
 (B) *Secondary cystitis*
 (a) K dney descending
 (b) Urethra ascending
 (c) Genitals or intestines regional
 (a) Cervix uterus
 (β) Prostate
 (ι) Rectum
- Path types** (1) **Catarrhal** Congestive
 (2) Hæmorrhagic
 (3) Bullous
 (4) Cystic multiple small cysts
 (5) **Follicular** Granular polypoid
 (6) Croupous membranous
 (7) **Ulcerative**
 (a) Diathermic
 (b) Pressure foreign bodies
 (c) Cystitic
 (d) Solitary trigonal
 (e) Specific tuberculous
 (8) **Leukoplakic**
 Precancerous metaplasia
 (9) Localised interstitial
 Hunner's ulcer
 Solitary ulcer at the vertex in females
 (10) **Alkaline encrusted**
 White plaques
 Alkaline urine
 Females
 (11) **Cystitis emphysematosa**
 Multiple small gas containing cysts

- Clinic:** (1) Painful frequency: **dysuria**
 (2) Changes in urine: **pyuria**, hæmaturia
 (3) General toxæmia: not marked

Signs: *Routine examination not in acute stage*

(A) Catheterisation + urine examination:

- (a) Physical
 (b) Chemical
 (c) Microscopical
 (d) Bacteriological

(B) Search for primary focus:

- (a) **Meatus:** Balanitis, urethritis
 (b) **Prostate:** Enlargement, gonorrhœa
 (c) **Cervix** Erosion
 (d) Abdominal palpation **kidneys**
 (e) Eyes and reflexes **Tabs**
 (f) **Spine:** Paralysis

(C) Cystoscopy:

- (a) Vascular changes
 Hæmorrhagic cystitis
 (b) Mucous membrane changes
 (α) Surface
 (1) Desquamation
 (2) Pseudo membrane
 (β) Sub-epithelial
 (1) Œdema
 (2) Bullæ
 (3) Cysts
 (γ) Ulceration
 (δ) Proliferation granulations
 (c) Inflammatory products
 (1) Mucus
 (2) Epithelium
 (3) Blood
 (4) Pus
 (5) Membrane or slough
 (6) Products of urinary decomposition.
 (α) Deposits
 (β) Stones
 (d) Changes in bladder musculature
 (1) Distention
 (2) Trabeculation
 (3) False diverticula

(D) Excretion urography

- Clinic. types** (1) **Acute cystitis**
 (2) **Subacute cystitis**
 (3) **Chronic cystitis**
 (4) **Relapsing cystitis**

- (5) Recurrent cystitis
 (6) Insidious cystitis: tuberculosis
 (7) Secondary cystitis stricture urethra
- Compl. (1) Acute retention of urine
 (2) Ascending urinary infection
 (3) Calculus formation
- Diff diag (1) **Reflex vesical irritation:**
 (a) Pyuria absent
 (b) Cause elsewhere
- (2) **Secondary cystitis:**
 Cause elsewhere
- Treat (A) *Acute cystitis*
 (1) **Diuretics:** Internal flushing
 (a) Plenty of fluids
 (b) R Pot bicarb grs xx
 Pot citras grs. xx
 Pot acetas grs xx
 Tr hyoscyamus m xx
 Tr belladonnæ m v
 Spt chloroformæ m x
 Inf buchu ad ounce ½
 Ounce half every 4 hours
- (2) **Antispasmodics:**
 (a) Morphia or hyoscine
 (b) Hypogastric fomentations
 (c) Hot enema + morphia suppository
 (d) Hot sitz bath
- (3) **Chemical treatment:**
 (A) Acid urine
 (a) Alkaline mixture (See above)
 Every 4 hours
 + (b) Caprocol or hexylresorcinol
- (B) Alkaline urine
 (a) Acid mixture
 R Acid soda phosph grs. xx
 Acid phosph dil m v m
 Acid nitrohydrochl dil m v m
 Liq strychninæ m m
 Spt chloroformæ m x
 Inf gent co ounce ½
 Ounce half T. D. S
 + (b) Hexamine grs x before meals
- (4) **Urinary antiseptics:**
 (See under Bacilluria)
- (5) **Chemotherapy:** Sulphonamides

(c) **Symptomatic**

(a) Dysuria hot hip baths

(b) Pain

Instil 4 ounces of liq paraffin

(B) *Subacute and chronic cystitis*(1) *Medicinal*(a) **Diuretics** (See above)(b) **Chemical treatment** (See above)

↑↓ (a) Alkaline week

(b) Acid week

(c) **Urinary antiseptics**

(See under Bacilluria)

(2) *Local*(a) **Instillations**

(a) Silver nitrate 2%

(β) Acetic acid in alkaline cystitis

(γ) Soda bicarb in acid cystitis

(b) **Bladder washes**

(1) Mercury oxycyanide 1 in 4000

(2) Pot permanganate 1 in 2000

(3) Mercurochrome 1 in 100

(4) Acriflavine 1 in 10000

(5) Boric acid half saturated

(c) **Cystoscopic applications**

(a) Leukoplakia

(β) Hunner's ulcer

Absolute alcohol injection
around the periphery(d) **Urinary drainage**

(a) Urethral drain

(β) Suprapubic cystostomy

(3) *Specific*

(a) Vaccines and sera

(b) Chemotherapy

(c) **Mandelic acid regime**(2) **TUBERCULOUS CYSTITIS**

Etiology (1) T B kidney

(2) T B prostate or seminal vesicles

Morbidity Tubercles ulcers granulations fibrosis

Clinical Spontaneous and insidious gradually progressive and persistent cystitis in young adults

Signs (1) Cystoscopy

(A) Golf-hole ureter

(a) Edema of orifice

- ↓ (b) Small tubercles around orifice
 - ↓ (c) Gaping orifice
 - ↓ (d) Retracted orifice
- (B) Bladder
 - Thickened contracted
- (2) **T B elsewhere in genito urinary system**
 - (a) Kidney
 - (b) Prostate
- (3) **T B bacilluria**
- Compl (a) Renal failure
- (b) Urinary sepsis
- (c) Extension to other organs
- Treat (1) **Removal of etiology**
- (2) **General anti tuberculous treatment**
- (3) **Local treatment**
 - (a) Lavage (contraindicated)
 - (b) Instillations
 - (c) Applications
- (4) **Symptomatic treatment**
 - (a) Alkalies
 - (b) Antispasmodics
 - (c) Sandalwood oil
- (5) **Palliative treatment**
 - (a) Ureteral diversion
 - Ind Intolerable pain
 - Tech Cutaneous ureterostomy
 - (b) Pre sacral neurectomy
- (6) **Addit onal measures (Med Ann 1935)**
 - (A) Rovsing's treatment
 - Irrigations of 6% warm carbolic acid
 - (B) Hollander's treatment
 - (a) Pot. iodide internally
 - ↓ (b) Calomel emulsion instillations
 - = (c) Mercury iodide formation
 - (C) Witzack's treatment
 - Instillations of 20% lactic acid
 - (D) Greenberg's treatment
 - (a) Methylene blue pills
 - 2 grs T D S for three weeks
 - + (b) Methylene blue instillations
 - 10% twice a week
 - + (c) Warm liquid paraffin instillations
 - 4 ounces once a week
 - + (d) Soda bi-carb irrigations
 - 2%
 - + (e) Alkalies by mouth

(3) TYPHOID CYSTITIS

- Etio Convalescence from typhoid
 Clinic. (a) Cystitis
 (b) **Typhoid bacilluria**: Typhoid carriers
 (c) History
 Treat (1) As for cystitis
 (2) Anti typhoid measures

(IV) TUMOURS:

(1) PAPILLOMA BLADDER

- Etio (a) **Secondary**: To renal pelvis
 (b) Bilharzias
 (c) Aniline dye workers
 (d) Leukoplakic
 Incidence. Young adult males
 Path types (1) Papillary
 (2) Papillary → infiltrating
 (3) Infiltrating
 Special (a) **Spread by implantation**
 (b) **Infiltration**: Malignancy
 (c) **Recurrence**
 Clinic **Profuse, painless, intermittent, abrupt, bright-red hæmaturia**
 Signs (1) **Hæmaturia** or growthuria
 (2) **Cystoscopy**:
 Pedunculated, villous, single or multiple
 Site Above and external to ureteral openings
 Compl (1) **Hæmaturia**:
 Treat Silver nitrate instillations
 (2) **Retention of urine**:
 Treat Bladder massage
 (3) **Infection**:
 (a) Local
 (b) Ascending
 (4) **Calculus**
 (5) **Malignancy**
 Treat (A) *Conservative*
 Daily instillations of silver nitrate
 2 ounces of 1 in 3500 sol
 (B) *Operative*
 (1) Urethral cystoscopic removal
 (2) **Electro coagulation**:
 Ind. Accessible and recurrent
 Tech. Sitzings at fortnightly intervals
 ↓ Follow up every 3 months for 3 years

(3) **Suprapubic cystostomy :**

- Tech Diathermy knife or fulguration
 Points (a) Protection of the wound
 (b) Silver nitrate instillations

(C) *Special* in bilharzial papillomataIntravenous tartar emetic $\frac{1}{2}$ gr in 10 c.c.s.

- Post treat (1) **Silver nitrate instillations**
 (2) **Repeated inspections**

- Post seq (1) Recurrence
 (2) Implantation
 (3) Malignancy

(2) **CARCINOMA BLADDER**

Etio Incidence Males between 40 and 50

- Predis (a) **Papilloma**
 (b) **Leukoplakia**

Path (A) *Primary*

- (1) **Malignant papilloma :**
 Infiltrating papilloma
 (2) **Bun-shaped pedunculated**
 (3) **Infiltrating :**
 Widely spreading scirrhous
 (4) **Carcinomatous ulcer :**
 Raised, everted, indurated margins

(B) *Secondary To*

- (a) Cervix uteri
 (b) Prostate
 (c) Rectum
 (d) Intestines
 (e) Kidney

- Histology (1) Squamous
 (2) Adeno-carcinomatous
 (3) Spheroidal

- Course (1) Local growth
 ↓ (2) Surrounding infiltration
 ↓ (3) Lymphatic permeation
 ↓ (4) Blood metastases rare

- Compl (1) **Infection :**
 (a) Vesical → ascending
 (b) Perivesical
 (2) **Obstruction :**
 (a) Proximal dilatation
 (b) Suppression urine → uræmia
 (3) Urinary fistulæ
 (4) Hæmaturia
 (5) **Cachexia and exhaustion**

Clinic (A) Hæmaturic :

. Pronounced, painless or painful hæmaturia

or (B) Cystitic :

Septic cystitis

or (C) Urinary obstruction

↓ (D) Late symptoms :

(a) **Pain :** Dysuria, strangury

(b) Multiple urinary fistulæ

(c) **Emaciation :**

(a) Hæmorrhage

+ (β) Toxæmia

(1) Septic

(2) Uræmic

(3) Malignant

Signs (1) Urine examination :

Growthuria

(2) Rectal examination :

Growth of the bladder felt per rectum is never innocent

(3) Cystoscopy :

(a) Nature of the growth

(b) Extension of the growth

(c) Condition of the bladder

Treat (A) Radical

Contraind (a) Local growth beyond the bladder

(b) Urinary (α) Urinary sepsis

(β) Kidney failure

(c) General (α) Pulmonary diseases

(β) Circulatory diseases

(γ) Cachexia

Operations (1) Cystoscopic diathermy fulguration

Ind Early suspected cases

Contraind (i) Cloudy urine

(b) Hæmorrhage → clot removal

(c) Inaccessible situation

(2) Resection with healthy resection

Ind Early solitary growth

(3) Partial cystectomy :

(6) (a) Preliminary ureteric transplant.:

(α) Into the colon

(β) Into the skin

↓ (b) Total cystectomy:

Ind (a) Multiple malignant papilloma

(b) Trigonal growths

(c) Intractable cystitis

(B) *Palliative*

(1) Diathermy resection:

(a) Suprapubic with cystostomy

(b) Urethral

(2) Radiation:

(a) Radium

(α) Interstitial irradiation

(β) Radon seeds

(γ) Surface applications

(b) Deep X Rays

(c) Low voltage contact therapy

After suprapubic cystostomy

(C) *Symptomatic*(1) *Hæmaturia*

(a) Silver nitrate lavages (1-10,000)

(b) Adrenaline or silver nitrate instil

(c) General treatment

(2) *Pain*

(a) Conservative

(α) Morphia and suppositories

(β) Bladder lavages

Hcl m xx in H-O pint 1

(γ) Bladder instillations

(1) Aspirin

(2) Liquid paraffin

(b) Conservo-operative

Intraspinal alcohol injection

(c) Operative

(α) Cotte

Presacral neurectomy

(β) Færster

Posterior rhizotomy

(γ) Spiller

Lateral chordotomy

Routes for bladder growth treatment(1) *Per urethral*

Tech Cystoscopic excision diathermy or fulguration

Ind Early suspicious growth

- Contra : (a) Cloudy urine
 (b) Hæmorrhage
 (c) Clot retention
 (d) Inaccessibility
- (2) Suprapubic :
 Ind : (a) Malignant growths
 (b) Borderline growths
 (c) Associated complications :
 (α) Cystitis
 (β) Stones
 (γ) Enlarged prostate
 (d) Irritable bladder
- Tech. (a) Diathermy fulguration
 (b) Diathermic excision
 (c) Local resection
 (d) Partial cystectomy
 (e) Hemicystectomy
 (f) Total cystectomy
- Compl (a) Wound implantation
 (b) Permanent suprapubic fistula

(3) SARCOMA BLADDER

- Etio. Extremes of life
 Path : (a) Submucous
 (b) Perivesical
 Clinic : (a) Pedunculated
 (b) Sessile

(V) VESICAL CALCULUS : (See Urinary Lithiasis)

- Etio : (1) **Metabolic errors :**
 (a) Vitamine deficiency : (Vit. A)
 (b) Calcium disturbances
- (2) **Urinary errors :**
 (a) Stagnation : leading to
 (α) Precipitation
 (β) Changed chemical reaction
 + (b) Infection : leading to
 (α) Decomposition
 (β) *Inflammation*
 (c) Foreign bodies

- Path : (1) **Uric acid or urates :**
 : Shaligrams ; moderate growth
- (2) **Oxalates :**
 : Mulberry mass ; slow growth
- (3) **Phosphates :**
 : Chalky ; rapid growth
- (4) Cystin ; xanthin ; indigo

Path. types : (A) **Primary : Metabolic pathology**
 Source : Kidney
 Medium : Sterile urine

- Comp : (a) Uric acid
(b) Calcium oxalate

(B) Secondary : Local pathology

Source : Bladder

Medium : Infected, stagnated urine :

- (a) Stagnation
↓ (b) Decomposition
↓ (c) Infection
↓ (d) Changed reaction

Comp : Phosphatic encrustations over nucleus of :

- (a) Kidney stone
(b) Foreign body

Sites : (1) **Bladder : Post-prostatic pouch**

(2) Prostatic urethra

(3) Diverticulum

Clinic : (1) **Dysuria and strangury :**

: Sharp, cutting pain at the base or end of the penis

(2) **Urine :**

(a) **Hæmaturia : slight, painful**

(b) **Crystaluria**

(c) **Pyuria** : if urinary infection

(3) **Symptoms of primary focus : (Secondary stones)**

(a) **Enlarged prostate**

(b) **Stricture urethra**

(c) **Cystitis**

(4) **In children :**

(a) **Erection and masturbation**

(b) **Crying micturition**

(c) **Ammoniacal smell of left palm**

Signs : (1) **P. R or P. V. : Bimanual**

(2) **Sounding or metal catheterisation**

(3) **Radiography :**

: Negative in uric acid & urates

(4) **Cystoscopy**

Diagnosis : Symptoms : (a) Aggravated by movements

(b) Relieved by rest

Comp : (1) **Acute urinary retention**

(2) **Back pressure**

(3) **Infection : Local and ascending**

(4) **Growths**

Treat : (A) **Treatment of etiology :**

(a) **Treatment of metabolic error**

(b) **Treatment of urinary error :**

(a) **Obstruction**

(b) **Infection**

(B) Treatment of calculus :**(1) Litholapaxy or lithotrixy :**

- Ind : (a) Experienced surgeon
 (b) Endemic regional cases
 (c) No urinary infection
 (d) No urethral obstruction

- Contra : (A) **Calculus : Unsuitable**
 (a) Too large or small
 (b) Too hard or soft
 (c) Impacted in a diverticulum

- (B) **Bladder : Infection**
 (a) Cystitis
 (b) Small irritable bladder
 (c) Diverticulum bladder
 (d) Growth of the bladder

- (C) **Urethra : Obstruction**
 (a) Small bore : children
 (b) Stricture
 (c) Enlarged prostate
 (d) Acute urethritis

- (D) **Kidney : Inefficiency**
 (a) Infection
 (b) Inefficiency

(E) Inexperience of the surgeon

- Instrument : (1) Blind lithotrite
 (2) Ryall's cystoscopic lithotrite
 (3) Young's cystoscopic rongeur

Tech : (See under Operations)

- Post. compl : (a) Perforation bladder
 (b) Hæmorrhage
 (c) Ascending urinary sepsis
 (d) Anuria \rightarrow uræmia

- Advantage : (a) No cutting operation
 (b) Short convalescence

- Disadvantage : (a) Blind technique
 (b) Recurrence

(2) Suprapubic lithotomy :

Ind : All cases where litholapaxy is not specially indicated

Tech : (See under Operations)

(VI) BLADDER FISTULAE :**(1) SUPRAPUBIC VESICAL FISTULA :**

Etiology : (1) **Congenital : Patent urachus** (See page 1685)

Site : Umbilicus

Clinic : Umbilical urinary fistula

Cause : Urethral obstruction

- Treat : (a) Removal of the obstruction
 + (b) Excision of the urachus

(2) **Acquired :**

- (a) **Sepsis :** Extravasation of urine
- (b) **Malignancy**
- (c) **Post-operative :**
 - (α) **Distal urinary obstruction**
 - (β) **Sepsis and irritation**
 - (γ) **Fibrosis and adhesions**
 - (δ) **Malignancy**

Clinic Suprapubic opening discharging urine

Sign. Intravenous or intramuscular dye injection

↓ Colouring of the discharge

Compl (a) *Inconvenience*

(b) *Skin irritation*

Treat (1) **Emollients to the skin :**

Sterile vaseline or paraffin

(2) **Removal of etiology :**

Distal obstruction

(3) **Urethral drainage**

(4) **Permanent urinal contrivance .**

Cause irremovable

(2) **VESICO INTESTINAL FISTULA .**

Sites . (a) **Rectum**

(b) **Sigmoid**

(c) **Cæcum**

(d) **Ileum**

Etio . (A) **Congenital : Cloacal abnormality**

(B) **Trauma :** (a) **Parturition**

(b) **Fracture pelvis**

(c) **Wounds**

(C) **Inflammation :** (a) **Appendicular abscess**

(b) **Diverticulitis**

(c) **Regional enteritis**

(d) **Tuberculosis**

(D) **Neoplastic : Carcinoma sigmoid or rectum**

Symp : (1) **Cystitis**

(2) **Pneumaturia or fæces uria**

(3) **Urine per anum**

Signs . (a) **Rectal examination**

(b) **Barium enema or meal**

(c) **Intravenous pyelography**

(d) **Cystoscopy**

(e) **Sigmoidoscopy**

Compl : (1) **Ascending urinary infection**

(2) **Intestinal obstruction**

(3) **Peritonitis or peritoneal abscess**

Treat: (1) Plastic operations :

- Ind: (a) No infection
 (b) No malignancy

Tech: Combined: intraperitoneal + intravesical

(2) Diversion operations :

- Ind: (a) Malignancy
 (b) Sepsis
 (c) Preliminary to plastic

Tech: (1) Short circuit
 (2) Colostomy: proximal

(3) VESICO-VAGINAL FISTULA

Etio: (a) Trauma: (a) Parturition
 (b) Operation

- (b) Malignancy: carcinoma cervix

Clinic: (1) Dribbling urine per vaginum

- (2) Cystitis
 (3) Local examination: vaginal
 (4) Cystoscopy: chromo cystoscopy

Compl: (a) Irritation of skin
 (b) Inconvenience
 (c) Ascending urinary infection

Treat: (A) Preliminary :

- (a) Bladder lavage
 (b) Vaginal douches
 (c) Urinary antiseptics

↓ (B) Suprapubic cystostomy

↓ (C) Plastic repair :

Tech: (a) Excision of the fistula
 (b) Separation of organs
 (c) Separate closure
 (d) Bladder drainage

Routes: (a) Vaginal
 or/ + (b) Vesical
 or (c) Peritoneal

Post. treat: (1) Continuous closed drainage
 + (2) Prone position

(4) VESICO-PERINEAL :

Etio: (a) Perineal lithotomy
 (b) Malignancy
 (c) Prostatic abscess: tuberculous

(VII) BLADDER TRABECULAE & DIVERTICULAE :**(1) TRABECULATION OF THE BLADDER :**

Def Elevations of muc membrane caused by intravesical projections of the muscular bundles of the vesical wall.

- Site Any part except
 (a) Trigone
 (b) Inter ureteric bar
- Types (1) Hypertrophic trabeculation
 Cause Lower urinary obstruction
 Path Hypertrophied and contracted bladder
 Clinic Frequent scanty micturition
 Treat Removal of the obstruction
 (2) Nervous disease trabeculation
 Cause Tabes dorsalis or spinal lesions
 Path Paralytic obstruction
 Clinic Retention or incontinence
 Treat Palliative
 (3) Idiopathic Old age
- (2) DIVERTICULUM OF THE BLADDER
- Def A pouch communicating with the bladder
 (a) Lined by mucous membrane
 (b) Surrounded by fibrous tissues
 (c) Protruding through muscular hiatus
 (a) Congenital
 or (b) Acquired
- Types (A) False
 Multiple shallow depressions between trabeculae
 (B) True
- Etio (1) Congenital
 (2) Acquired
 (a) Tension
 Intravesical tension due to distal obstruction
 (b) Traction
 Due to adhesions
- Sites Weak spots of the bladder
 (a) Around the intramural ureter
 (b) Immediately above the trigone
 (c) Region of the urachus
- Clinic (1) Intractable recurrent cystitis
 (2) Pronounced pyuria
 (3) Two-stage micturition
 (4) Bimanual palpation
 (5) Two-stage catheterisation
 (6) Cystoscopy
 (7) Urography
 (a) 15 % sodium iodide or bromide
 (b) Lateral plates
- Compl (1) Back-pressure
 Hydro ureter \rightarrow hydro-nephrosis
 (2) Ascending infection
 Cystitis \rightarrow pyelitis
 (3) Calculus
 (4) Malignancy
- Treat (A) Pre-operative investigations About

- (a) The local condition
 - (b) Complications present
 - (c) Renal function
 - (B) Pre-operative preparations
 - (a) Urinary antiseptics
 - (b) Renal efficiency
 - (C) Operations (See under Operations)
 - (1) Suprapubic excision
 - (a) Extravesical
 - (a) Intraperitoneal
 - (β) Extraperitoneal
 - (b) Intravesical
 - After cystotomy
 - or (1) Invagination Of the sac
 - or (1) Marsupialisation Of the sac
 - + (2) Cystostomy
 - + (3) Extravesical drainage
- If urinary sepsis or/ + renal failure.*
- Two-stage operation
- (a) Drainage of bladder and diverticulum
 - ↓ (b) Excision and repair
- Post. treat (1) Diuretics and urinary antiseptics
- (2) Bladder lavage
- Post. compl (1) Ascending urinary infection
- (2) Anuria → uraemia
- (3) Intercurrent chest complications

(VIII) HERNIA OF THE BLADDER:

- Etio: (a) Urinary obstruction
- (b) Traction
- Path: (a) Extra or pro-peritoneal gliding inguinal hernia
- (b) Intra peritoneal
- (c) Para peritoneal direct inguinal hernia
- Assn. (1) Direct inguinal hernia
- (2) Gliding inguinal hernia
- Clinic: (1) **Hernia with urinary symptoms:**
- (a) Frequent or difficult micturition
 - (b) Effect of micturition on the size
 - (c) Catheter guided into the sac
- (2) **Hernia without urinary symptoms:**
- (a) Operative trauma with leaking urine
 - (b) *Adherent pad of fat.*
- . To the medial side of the neck of the sac*
- Compl: Trauma to the bladder.
- Etio. In herniotomies
- Treat: (a) Close the rent
- (b) Drain the herniotomy wound · 3 days
- (c) Urethral drain: 10 days

(IX) OPERATIONS ON THE BLADDER:**(A) Pre operative measures**

- (1) **Renal function restoration :**
 - (a) Urinary drainage
 - (b) Diuretics and hydrotherapy
- (2) **Urinary antiseptics**
 - (a) Medicinal
 - (b) Local
 - (a) Drainage
 - (β) Lavage
- (3) **General health**

(B) Bladder instrumentations**(1) CATHETERISATION**

- Ind
- (a) **Relief of retention**
 - (b) **Vesical trauma**
 - (c) **Vesical and supravescical drainage**
 - (d) **Vesical lavage or instillations**
 - (e) **Urethral trauma**
 - (f) **Urethral stricture**

1.**Contraind
Catheters**

- (a) **Varieties**
 - (α) Rubber
 - (β) Gum elastic
 - (γ) Metal
- (b) **Shapes**
 - (1) Ordinary
 - (2) Prostatic
 - (3) Coude
 - (4) Bicoude
 - (5) Olivary
 - (6) Self retaining
- (c) **Sizes**
 - (1) **Charriere or French :**
No 4 - 30
Denotes the external circumference
in millimetres
 - (2) **Benique :**
Twice the Charriere
 - (3) **American :**
2/3 rds the Charriere
 - (4) **English :** (has a catheter gauge)
2 less than American
No 1 1/2 to 15 (No 8 E has diameter
of 5 m.m. & every size upwards
or downwards varies by 0.5 m.m.)
- (d) **Sterilisation**
 - (1) **Metal and rubber :**
• Boiling

(2) Gum elastic .

- (a) Cover with cloth or lint
Immerse in boiling water for
2 minutes

Steep in sterile boric lotion

- (β) Formalin vapour sterilizer .

Rinse in normal saline

Lubricants (a) Sterile vaseline

(b) Sterile liquid paraffin

(c) **Sterile olive oil**

(d) Hyd oxycyanide grs 3½

Glycerine drachms 5½

Tragacanth grs 46

Aqua distil sterile ad ounces 3

(Pye's surgical handicraft)

Tech (a) **Cleanse the glans and prepuce**

(b) **Anterior urethral irrigation**

(c) **Urethral anæsthesia**

Solutions (a) Novocain 4 %

(β) Percaine 1 in 1500

(γ) Decicaine 2 %

(δ) Cocaine 5 %

(u) Cocaine hydrochlor grs iii

Sodium bicarbonate grs iii

Chloretone gr. 1½

Distilled water ounce 1½

Tech (a) Inject 2 dms by urethral syringe

(β) Apply penile clamp

(γ) Repeat thrice (α) & (β) :

At the interval of three minutes

(d) **Rigid antisepsis of :**

(1) Hands

(2) Catheters & lubricant

(3) Meatus and glans

(4) Surroundings sterile towels

(e) **Catheteric manœuvres :**

(1) Rubber → gum elastic → metal

(2) Go from biggest to smallest size :

Normal urethra is 20 F or 12 E.

(3) *Never force your way in*

(4) Keep steady pressure

(5) Keep to the roof of the urethra

Post treat (a) Tie in the catheter

Ind (1) Gradual decompression of bladder

(2) Continuous dilatation of

- (b) *Gradual decompression in acute retent*
 Rate 4 ounces each hour
 Methods (α) Intermittent evacuation
 Every two hours
 (β) Continuous decompression
 Hidd's U tube
 (c) Bladder lavage if required
 (d) Diuretics and urinary antiseptics
- Compl (1) **Urethral obstruction**
 Treat (a) Conservative antispasmodics
 (b) Meiotomy
 (c) Urethrotomy
 (d) Suprapubic puncture
- (2) **Urethral shock**
 Treat (a) Urethral anæsthesia
 (b) Stimulants
 (c) Avoidance of
 (α) Rough handling
 (β) Handling in 2nd stage of
 general anæsthesia
- (3) **False passage**
 Etio (A) Urethral obstruction
 (a) *Stricture*
 (b) *Enlarged prostate*
 + (B) Rough handling
- Clinic (a) Urethral obstruction
 + (b) Forcing the way
 ↓ (c) Sudden advance
 + (d) Sharp pain
 + (e) Escape of blood
 + (f) *Impaction of catheter*
 + (g) Absence of urine
- Treat (1) Delicate handling
 (2) Keep to the roof
 (3) *Avoid small metal catheters*
- (4) **Absence of urinary flow**
 Causes (1) False passage impacted catheter
 (2) Blocked catheter (a) *Stilette*
 (b) *Irrigate*
 (3) Anuria catheter in + no urine
 (4) Previous recent urine evacuation
 Always inquire beforehand
 (5) Rupture bladder
- (5) **Hæmorrhage**
 Causes (a) False passage
 (b) Malignancy

(6) Rupture bladder :

Cause : (a) Rough handling

+ (b) Small bladder

+ (c) Small metal catheter

Clinic. (a) Difficult catheterisation

+ (b) Rough handling

+ (c) Pain + shock

+ (d) Urine flow absent or meagre

Treat Immediate suprapubic exploration

(7) Breaking of catheter :

Treat Removal (a) Urethral

(b) Suprapubic

(8) Urethral fever

Path Urethral toxæmia

Clinic Rise in temperature

Treat (a) Previous dose of quinine grs. v.

(b) Urinary antiseptics pre & post

(9) Infection :

Etiology (a) Want of care in asepsis

(b) Repeated catheterisation

(c) Continuous indwelling catheter

(d) Paralysed bladder

Clinic (1) Urethritis

↓ (a) Peri urethral abscess

↓ (b) Urethral fistula

↓ (2) Cystitis

↓ (3) Pyelitis

Treat (a) Diuretics and antiseptics

(b) Closed aseptic drainage

(c) Bladder lavage

(d) Avoidance of catheterisation :

As far as possible

(a) In acute stage

(β) In paralysis

(γ) Frequent or repeated

(δ) Continuous

(10) Anuria :

Cause (a) Instrument. in acute conditions

(b) Sudden complete relief of acute retention

Treat (1) Gradual bladder decompression

4 ounces per hour

(2) Hydrotherapy and diuretics

(11) Hæmaturia

Cause (a) Sudden complete relief of acute retention

(b) Bladder growths

- Treat: (a) Gradual bladder decompression
 (b) Hot bladder lavage
 (c) Astringent instillations:
 (a) Silver nitrate
 (β) Adrenaline
 (d) General treatment of hæmorrhage

(12) Urethral fistula or stricture:

Cause. Indwelling metal catheter

Path: (a) Urethral irritation

↓ (b) Urethral ulceration

↓ (c) Urethral perforation: fistula

or (c) Urethral fibrosis. stricture

Site *Peno scrotal junction*

Treat Avoid indwelling metal catheter:
 . Especially in children

(2) SOUNDING

Def. Passage of solid graduated metal bougies for:

(a) Diagnosis.

(a) Urethral conditions

Stricture, stone

(β) Bladder conditions:

Stone

(b) Treatment.

Urethral conditions (stricture)

(c) Guide.

To bladder in operations

Preparation. Distension of the bladder. By

(a) Retention of urine

or (b) Instillation of half a pint boric lotion

Tech: As in catheterisation

Compl: " " "

(3) CYSTOSCOPY

Ind. (a) Examination of bladder, ureter & pelvis

or (b) Treatment of bladder conditions

+ (c) No urethral obstruction

Tech. (1) Urethral lavage and anæsthesia

(2) Bladder lavage and distension:

: By clear colourless fluid

(3) Lubricant. glycerine

(4) *Test the light: before passing*

(5) Introduction of the cystoscope

(6) Lavage and distension with clear fluid

(7) Examination or treatment:

Normal: (a) Air bubble: fundus

(b) 4 o'clock: left ureteric orifice

(c) 8 o'clock: right ureteric orifice

- Tech (a) Simple cystoscopy
 (b) Chromo cystoscopy
 (c) Ureteral catheterisation
 (d) Retrograde pyelography
 (e) Operating cystoscope :
 (a) Rongeur
 (b) Electrode
 (c) Lithotrite
 (8) Lavage and evacuation of bladder
 Compl As in catheterisation

(4) BLADDER WASHES.

- Ind. (a) Infection
 (b) Hæmorrhage
 (c) Pre instrumental or operative
 (d) Post operative
- Lotions · (1) **Saturated boric lotion + sterile water**
 (2) **Oxycyanide of mercury . 1 in 8000**
 (3) **Silver nitrate . 1 in 10,000**
 (4) Potash permanganate . 1 in 4000
 (5) Mercurochrome . 1 in 1000
 (6) Acriflavine : 1 in 10,000
 (7) Acetic or phosph acid . 1 in 100
 Alkaline cystitis
- Quantity 3 ounces at a time
 Temp 110° F
 Receptacle . 2 Pints
 Height 3 Feet
 Methods . (1) Irrigating (two channelled) catheter
 (2) Syringe and catheter
 (3) Tube, funnel and catheter

(C) *Bladder operations*

(1) SUPRAPUBIC DRAINAGE .

Ind (A) **Acute urethral obstruction :**

- (a) Acute urethritis or prostatitis
 (b) Urethral trauma
 (c) Impassable stricture

(B) **Chronic conditions :**

- (a) Bladder and kidney infections
 (b) Urinary obstructions
 (c) Kidney inefficiency
 (d) Post operative drainage
 (e) Paralytic bladder: spinal conditions

Tech. (A) **ASPIRATION :**

Ind · **Acute retention by temp. cause :**

- + (a) Catheter contra indicated
 (b) Catheterisation impossible

- Tech (1) Aspiration with 20 c.c.s syringe and long slender needle
 (2) Do not empty the whole bladder
 (3) Do not repeat more than thrice: 8 hourly intervals
 (4) Do not allow the bladder to get more distended
 (5) Associate with
 (a) Hot hip baths
 (b) Antispasmodics

Compl Leakage into the cave of Retzius

(B) SELF RETAINING CATHETER:

Ind Acute retention requiring prolonged treatment:

- + (a) Catheterisation inadvisable
 (b) Catheterisation impossible

- Tech (1) Puncture with trocar and cannula
 (2) Withdraw trocar
 (3) Introduce de Pezzer catheter
 (4) Withdraw cannula
 (5) Gradual closed decompression

(C) CYSTOSTOMY

Ind (1) Trauma:

- (a) Complete rupture urethra
 (b) Rupture bladder
 (c) Foreign bodies
 (d) Hæmorrhage bladder.
 (clot retention)

(2) Urinary sepsis:

- (a) Cystitis
 (b) Pyelitis

(3) Urinary obstruction:

With back pressure:

- (a) Urethral obstruction
 (b) Prostatic obstruction

(4) Pre and post-operative:

- (a) Urinary sepsis
 (b) Urinary back pressure
 (c) Urinary hæmorrhage

- Tech (1) Keep the bladder full:
 (a) Abstain from passing urine
 or (b) Catheter + distension
 (2) Suprapubic midline incision
 (3) Rectus separation:
 : Guide pyramidalis

- (4) Exploration of Retzius cave
 - (5) Peel the peritoneum upwards
 - (6) Protect upper angle by gauze
 - (7) Anchor sutures in bladder wall
 - (8) Stab with narrow scalpel :
 - (a) *From above downwards*
 - (b) *Cutting edge towards symphysis*
 - (9) Finger exploration of bladder
 - (10) Treatment of the focus
 - (11) Drainage tube : stomy
 - (a) Self retaining de Pezzer :
For non infected cases
 - (b) Wide bore drain : for
 - (a) Infected bladder
 - (β) Vesical clots
 - (12) Closure of the bladder :
Around the tube
 - (13) Anchoring of bladder to rectus
 - (14) Retzius drain
 - (15) Closure of the incision
 - (16) Anchoring bladder tube to skin
- Drainage (A) **Temporary :**
- . Upto removal of the drainage tube (usually 48 to 72 hrs)
 - (a) **Exhaust method :**
 - (1) **Cathcart :**
: Three way Y tube
 - (2) **Bunsen :**
: Vacuum pump
 - (3) **White :**
: Suprapubic evacu.
 - (b) **Siphon method :**
: Tube connected to vacuum bottle
 - (c) **Thompson & Wright :**
: **Lamp-wick method**
 - (1) 1 sq yard of gauze
drawn out
through 34" of
Paul's soft tube
 - (2) Sterilise by boiling
 - (3) Wet the wick with
boric lotion

- (4) Tuck in ends .
 - (a) One into sinus
 - (b) Other into bottle
- (5) Kaolin + vaseline
To the skin around

(B) Permanent :

- (a) **Overflow apparatus :**
Hamilton Irving's cup
- (b) **de Pezzer catheter :**
With rubber urinal
- (1) **Closed drain :**
Lead to a sterile bottle
with antiseptic in it
- (2) **Open drain :**
 - (a) Skin emollients
 - (b) Copious dressings
 - (c) Frequent dressings
- (3) **Decompression drain :**
 - Ind Acute retention
 - Tech (a) Intermittent method
Release the clamp
on the catheter
every hour and let
out 4 ounces
 - (b) Continuous method
Kidd's U tube

(2) SUPRAPUBIC CYSTOTOMY

- Ind (1) Exploratory
- (2) Therapeutic
 - (a) Bladder conditions
 - (b) Prostate enlargement
 - (c) Prostatic urethra
 - (d) Ureteral openings
- (3) Drainage
 - (a) Infection
 - (b) Chronic back pressure
- Contra Acute urinary retention
- Anæsth (A) **Local** (a) Skin and subcutaneous
↓ (b) Muscle and aponeurosis
- (B) **Intravenous sodium evipan**
- (C) **Spinal**
- (D) **General**

- Steps (1) *Bladder lavage and distension*
12 ounces of boric lotion
- (2) Incision midline
5" above symphysis to umbilic
- (3) Incision of rectus sheath
- (4) Separation of the recti
- (5) Incision of transversalis fascia
- (6) *Stripping up of peritoneal reflection*
- (7) Exposure of bladder and Retzius cave
- (8) Gauze protection of upper angle
- (9) Anchor stitches in bladder wall
(a) Muscle fibres
(b) Veins
- (10) *Aspiration of urine*
- (11) Empty the bladder
- (12) Stab with knife
(a) *Narrow bladed*
(b) *Cutting edge towards symphysis*
(c) *Cut from above downwards*
- (13) Explore the cavity with a finger
- (14) Treat the intra vesical condition
- (15) Closure of the bladder
(a) Complete closure + urethral drain
Ind (a) Clean urine
(b) Renal function good
(r) No distal obstruction
(b) Cystostomy
Ind (a) Infection
(b) Obstruction
(c) Renal incompetency
(d) Hæmorrhage
(e) Prostatectomy
(f) Fear of urine leakage
Tech (a) Rubber tube in upper angle
Of bladder incision
(b) *Suture the bladder incision*
Tightly around the tube
(c) Over sew by continuous stitch
(d) Fix the bladder to rectus
- (16) Pre vesical drain
- (17) Bring out
(a) Vesical tube at upper angle
(b) Pre vesical tube at lower angle
- (18) Muscle suture interrupted
- (19) Skin suture interrupted
- (20) *Fix up the vesical tube to the skin*

Difficulties (a) Injury to the peritoneum

- Etio** (a) Tear while stripping
(β) Injury while stabbing

- Pre treat** (a) Be gentle
(b) Stab low and downwards
(c) Cutting edge towards symphysis
(d) *Enlarge the stab upwards*
After finger exploration of bladder cavity

Treat Suture + extraperitoneal drainage

(b) Hæmorrhage

- Etio** (a) Hypertrophied bladder big veins
(b) Papilloma bladder
(c) Prostatectomy

- Treat** (1) Under running the veins
(2) Adrenaline instillations
(3) Hot packs

(c) Rupture bladder

- Etio** (a) Small and thin bladder
(b) Rough handling

(3) OPERATIONS FOR VESICAL CALCULUS**(A) LITHOLAPAXY OR LITHOTRITY**

- Anæsth** (a) General
(b) Spinal

Position Lithotomy or sup ne

- Steps** (1) *Bladder lavage and distension*
6 12 ounces of boric lotion
(2) Introduction of closed lithotrite
(3) Catching the stone at the trigone
(4) *Carry it to centre of the cavity*
(5) Crushing
(6) Repeat
(7) Close & withdraw the lithotrite
(8) Introduction of cannula
(9) Work the B gelow's evacuator
(10) Repeat the whole process
Search and treat the pieces
(11) Bladder lavage and distension
(12) Cystoscopy
(13) Tie in a catheter

- Post. treat** (a) Bladder lavage
Twice a day for two days
(b) Withdrawal of catheter
On the third day

- Compl : (a) Urethral shock
 (b) False passage
 (c) Hæmorrhage
 (d) Trauma to the bladder
 (e) Catheter fever
 (f) **Ascending urinary infection**
 (g) **Uræmia**
 (h) Epididymo orchitis
 (i) **Recurrence**

(B) SUPRAPUBIC LITHOTOMY .

- Ind. (1) **Secondary stones :**
 (a) Enlarged prostate
 (b) Vesical growths or diverticulum
 (c) Severe cystitis
 (2) **Renal inadequacy**
 (3) **Nature of calculus :**
 (a) More than 2" in diameter
 (b) Too hard a stone
 (c) Impacted stone
 (d) Stone in diverticulum
 (4) Surgeon's experience
- Steps : (1) Suprapubic cystotomy
 (2) Digital exploration
 (3) Introduction of stone forceps
 (4) Catching and removal of the stone :
 Do not include the bladder wall
 (5) Inspection of the removed stone :
 (a) Fracture
 (b) Facets
 (6) *Digital exploration . for other stone*
 (a) Bladder
 (b) Prostatic urethra
 (c) Lower ureters
 (d) Bladder diverticulum if present
 (7) Closure of the bladder : with
 (a) Catheter drain only
 (b) Cystostomy drain only
 (c) Cystostomy + catheter
 (8) Retzius drain
 (9) Closure of the wound

(C) PERINEAL LITHOTOMY :

Ind : Prostatic urethral stone

(4) CYSTECTOMY

- (2) Suprapubic bladder exposure
- (3) Protection of the wound
 - By silver nitrate swabs
- (4) Isolation and mobilisation of the part
 - (a) Extravesically
 - (b) Intravesically
- (5) Removal of the part
 - By d athermy knife
- (6) Closure of the defect
 - Around a tube in the bladder
- (7) Pre vesical drain
- After treat (a) Removal of pre-vesical drain 4th day
- (b) Removal of vesical drain 7th day

(B) TOTAL CYSTECTOMY

Ind Malignancy

- (a) More extensive for partial operation
- + (b) Non involvement of peri vesical organs
- Except prostate and vesicles

Investigations (1) Renal function
(2) Urinary sepsis
(3) General condition

- Stages (1) Preliminary suprapubic cystostomy
↓ (2) 3 Weeks
↓ (3) Preliminary ureteral transplantation
Winsbury White two-stage operation
↓ (4) One month
↓ (5) Total cystectomy

- Tech (a) Perineal approach
↓ (b) Separation of
(a) Rectum & peritoneum
from (β) Urethra prostate & vesicles
↓ (c) Suprapubic approach
Isolation & mobilisation of bladder
(d) Closure of peritoneal tears
(e) Ligature and division of
Lateral ligaments of the bladder
(f) Empty the bladder
(g) Ligature and division of
Pubo-vesical lig ments
(h) Division of
Bladder neck
(i) Removal of the bladder
(j) Closure with d-
(a) Suprap

(5) EXCISION BL

- Steps (1) C₃
(2) S₁

or (2) **Extraperitoneal lateral approach**

Tech · Para rectus L. incision

Advant (a) More room
 (b) Easier mobilisation
 (c) Easier ureteral identification

(3) De peritonisation of bladder

(4) Isolation of the sac

· Over the finger in its lumen

(5) Isolation and protection of

(a) Peritoneum

(b) Ureter

(c) Vas deferens

(d) Rectum

(e) Int. iliac vessels

(6) Excision of the sac

(7) Closure of the bladder defect

(8) Vesical and extra vesical drain

(9) Closure

Compl (1) Urinary sepsis

(2) Urinary calculus

(3) Hæmorrhage

(4) Trauma to ureters

(5) Enlarged prostate

(6) Malignancy

(7) Adhesions

(8) Residual urine

(9) Anuria → uraemia

(6) **INTRATHECAL ALCOHOL INJECTION:**Ind **Intractable pelvic pain ·**

(a) Carcinoma bladder

(b) Carcinoma cervix

(c) Carcinoma prostate

(d) Carcinoma rectum

Tech · (1) Lumbar puncture.

First lumbar interspace

(2) Injection intrathecal:

1-2 c cs of absolute alcohol

(3) Trendelenburg + side of pain up:

For 10 min to 3 hours

Compl Transitory. (a) Weak extremities

(b) Difficult sphincter control

(D) *Post-operative measures.*(1) *Bladder drainage:* (See under Cystostomy)(a) **Urethral:** Indwelling catheter for 10 days(b) **Suprapubic:**

(a) Self retaining catheter

(β) Cystostomy

- (2) Suprapubic bladder exposure
- (3) Protection of the wound
By silver nitrate swabs
- (4) Isolation and mobilisation of the part
 - (a) Extravesically
 - (b) Intravesically
- (5) Removal of the part
By diathermy knife
- (6) Closure of the defect
Around a tube in the bladder
- (7) Pre vesical drain
- After treat (a) Removal of pre vesical drain 4th day
- (b) Removal of vesical drain 7th day

(B) TOTAL CYSTECTOMY

- Ind Malignancy
 - (a) More extensive for partial operation
 - + (b) Non involvement of peri vesical organs
Except prostate and vesicles
- Investigations (1) Renal function
- (2) Urinary sepsis
- (3) General condition
- Stages (1) Preliminary suprapubic cystostomy
- ↓ (2) 3 Weeks
- ↓ (3) Preliminary ureteral transplantation
Winsbury White two-stage operation
- ↓ (4) One month
- ↓ (5) Total cystectomy
- Tech (a) Perineal approach
- ↓ (b) Separation of
 - (α) Rectum & peritoneum
 - from (β) Urethra prostate & vesicles
- ↓ (c) Suprapubic approach
 - Isolation & mobilisation of bladder
 - (d) Closure of peritoneal tears
 - (e) Ligature and division of
Lateral ligaments of the bladder
 - (f) Empty the bladder
 - (g) Ligature and division of
Pubo-vesical ligaments
 - (h) Division of
Bladder neck
 - (i) Removal of the bladder
 - (j) Closure with drainage
 - (a) Suprapubic
 - (b) Perineal

(5) EXCISION BLADDER DIVERTICULUM

- Steps. (1) Cystoscopy + ureteral catheterisation
- (2) Suprapubic cystotomy

or (2) Extraperitoneal lateral approach :

Tech : Para rectus L incision

Advant. (a) More room
(b) Easier mobilisation
(c) Easier ureteral identification

(3) De peritonisation of bladder

(4) Isolation of the sac :

: Over the finger in its lumen

(5) Isolation and protection of

(a) Peritoneum

(b) Ureter

(c) Vas deferens

(d) Rectum

(e) Int. iliac vessels

(6) Excision of the sac

(7) Closure of the bladder defect

(8) Vesical and extra vesical drain

(9) Closure

Compl. (1) Urinary sepsis

(2) Urinary calculus

(3) Hæmorrhage

(4) Trauma to ureters

(5) Enlarged prostate

(6) Malignancy

(7) Adhesions

(8) Residual urine

(9) Anuria \rightarrow uraemia

(6) INTRATHECAL ALCOHOL INJECTION :

Ind : Intractable pelvic pain :

(a) Carcinoma bladder

(b) Carcinoma cervix

(c) Carcinoma prostate

(d) Carcinoma rectum

Tech : (1) Lumbar puncture :

. First lumbar interspace

(2) Injection intrathecal :

. 1-2 c cs of absolute alcohol

(3) Trendelenburg + side of pain up :

: For 10 min. to 3 hours

Compl : Transitory. (a) Weak extremities

(b) Difficult sphincter control

(D) Post-operative measures.

(1) Bladder drainage : (See under Cystostomy)

(a) Urethral : Indwelling catheter for 10 days

(b) Suprapubic :

(a) Self retaining catheter

(b) Cystostomy

- (2) Suprapubic bladder exposure
- (3) Protection of the wound .
By silver nitrate swabs
- (4) Isolation and mobilisation of the part
 - (a) Extravesically
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Isolation & mobilisation of bladder
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Lateral ligaments of the bladder
(f) Empty the bladder
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(h) Division of
Bladder neck
(i) Removal of the bladder
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Over the finger in its lumen

(5) Isolation and protection of

(a) Peritoneum

(b) Ureter

(c) Vas deferens

(d) Rectum

(e) Int. iliac vessels

(6) Excision of the sac

(7) Closure of the bladder defect

(8) Vesical and extra vesical drain

(9) Closure

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(2) Urinary calculus

(3) Hæmorrhage

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(8) Residual urine

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For 10 min to 3 hours

Compl Transitory . (a) Weak extremities

(b) Difficult sphincter control

0) Post-operative measures .(1) *Bladder drainage* · (See under Cystostomy)(a) **Urethral :** Indwelling catheter for 10 days(b) **Suprapubic :**

(a) Self retaining catheter

(β) Cystostomy

- (1) Closed drain in a sterile bottle
 - (2) Open drain in the dressings
 - (a) Ordinary drainage
 - (b) Gradual decompression drainage
 - (c) Siphon drainage
 - (2) Dressings
 - (a) Protection of the skin :
Kaolin + vaseline
 - (b) Copious oft-changed dressings
 - (c) Removal of drains :
 - (a) Urethral 10th day
 - (β) Suprapubic Retzius 3rd day
 - (γ) Suprapubic vesical 6th day
 - (d) Bladder irrigations :

Ind	(a) Urinary sepsis	} See under Bladder washes
	(β) Urinary hæmorrhage	
 - Lotions

(a) Mercury oxycyanide	} See under Bladder washes
(β) Silver nitrate	
 - Route → Catheter → suprapubic tube → out
- (3) Medicinal
 - (a) Diuretics and hydrotherapy
 - (b) Urinary antiseptics
 - (c) Laxatives
 - (d) Tonics
- (E) Post-operative complications
 - (1) Shock :
Treat Anti shock measures
 - (2) Hæmorrhage :
Treat

(a) General anti hæmorrhagic	
(b) Local	(a) Hot irrigations
	(β) Instillations
	Adrenaline
	Silver nitrate
 - (3) Ascending urinary sepsis :
Treat

(a) Urinary antiseptics	Cylotropin
	Neotropin
 - (b) Bladder lavages
 - (4) Anuria → uræmia :
Treat

(a) Hydrotherapy	
	Oral, rectal, subcutaneous, venous
(b) Diuretics	
	Sodium sulphate . 42.85 gms. to litre
	2 to 3 litres per day
	: Intravenous continuous drip
 - (5) Sepsis of the wound : Sloughing
Treat Protection of the skin . kaolin + vaseline

(6) Pelvic cellulitis :

Cause Extravasation of urine

Treat: (a) Retzius drain

(b) Bladder drain

(c) Removal of all stitches

(d) Multiple incisions

(e) Anti toxic and anti uræmic measures

(7) Unhealing suprapubic fistula :

Cause: Urethral obstruction

Treat: Indwelling rubber catheter .

: For 10 days

(8) Chest complications**(9) Delirium nervosum****(10) Ventral hernia****(X) IMPORTANT POINTS**

- (1) First operation for rupture bladder was done in 1859 by Dr. Walther, a practitioner of Pittsburg, on a blacksmith
- (2) *Keep every patient who has had an abdominal contusion, under constant observation until he has passed an adequate amount of normal urine. Pass a catheter in every suspected case as early as possible, preferably in an operation theatre*
- (3) Bladder must be emptied *after the patient is anaesthetised* in cases of blind suprapubic drainage, to avoid injury to the bladder
- (4) Intraperitoneal rupture of the bladder is more common (80%) than extraperitoneal rupture (20%).
- (5) Prognosis of *intraperitoneal rupture of the bladder* varies with its duration, *immediate exploration* is far better than 'wait and see' policy
- (6) *At all times, if any reasonable suspicion exists as to the presence of rupture bladder, it is better to explore than to wait for physical signs*
- (7) *Catheterise every suspected case of rupture bladder and that too in an operation theatre*
- (8) *Treatment of rupture bladder :*
 - (a) Suprapubic cystotomy
 - ↓ (b) Exploration .
 - (α) Intraperitoneal
 - (β) Extraperitoneal
 - (γ) Vesical
 - ↓ (c) Suture of the tear
 - ↓ (d) Toilet

↓ (e) *Drainage :*

(a) *Peritoneal : if necessary*

(β) *Vesical :*

(1) *Suprapubic*

(2) *Urethral*

(γ) *Retzius.*

- (9) Pyelitis is the most common cause of chronic and recurrent cystitis
- (10) *B. coli* is the commonest organism in cystitis.
- (11) Cardinal symptoms in acute cystitis :
- (a) Frequency
- (b) Dysuria
- (c) Pyuria.
- (12) In reflex cystitis, pyuria is absent.
- (13) It is futile and even dangerous to prescribe acids in cases in which, in spite of ingestion of the acid, the urine remains alkaline, as in cases of proteus infection.
- (14) The first suprapubic lithotomy was done in 1560 by Nicholas Frankau of Laussane.
- (15) *The commonest cause of vesico intestinal fistula is diverticulitis of the colon, but carcinoma of the bowel vies with it for priority Preliminary colostomy is a necessity before radical operation*
- (16) In traumatic rupture of the bladder, when operation is performed within 12 hours, the mortality is 11%; when it is delayed to 24 hours, it is 55%.
- (17) Cardinal rules for treatment of cystitis :
- (A) *Acute stage :*
- (a) General and medical treatment only
- (b) *No instrumentation of any kind*
- (B) *Subacute stage :*
- (a) General and medical treatment
- + (b) Bladder lavage and instillations
- (C) *Chronic stage :*
- (a) General and medical treatment
- + (b) *Bladder lavage and instillations*
- + (c) *Removal of etiology.*
- (18) *Insidious cystitis may be the earliest and the only symptom of tuberculous kidney*
- (19) Causes of obscure urinary frequency :
- (a) Pseudo membranous trigonitis :
- Treat : Instillation of 4 drachms of 1-5% silver nitrate
- (b) Infection by *Trichomonas vaginalis*
- (20) *Lateral pictures after instillation of 3% sodium iodide are best for the diagnosis of bladder diverticulæ.*

- (21) It is generally agreed that malignant tumours of the bladder tend to remain confined to the bladder cavity.
- (22) Condition of the bladder in spina bifida :
 - (a) Spastic sphincter + spastic detrusor
 - (b) Relaxed sphincter + spastic detrusor
 - (c) Relaxed sphincter + relaxed detrusor.
- (23) It should only be after conservative measures have failed and after puberty, that any operative procedure such as presacral neurectomy or plastic sphincter, should be entertained for bladder paralysis in spina bifida.
- (24) *In spinal cord injuries, catheter is a grand executioner and whatever course is adopted, under no circumstances should the patient be catheterised. Suprapubic self-retaining catheter is the best.*
- (25) Contracted bladder is the *bete noire* of urological surgery and is the end result of chronic diffuse cystitis
- (26) The first sign of disseminated sclerosis, tabes dorsalis or even a cerebral or spinal tumour is interference with the function of micturition.
- (27) Age incidence in benign bladder tumours is 25 to 40, while that in malignant ones is 40 to 60
- (28) Association of pain and hæmaturia
 - (a) *Painful slight hæmaturia . urinary stone*
 - (b) *Painless profuse hæmaturia urinary papilloma.*
- (29) Difference between papilloma and carcinoma :
 - (a) Papilloma :
 - : Pedicled ; long villi
 - : No infiltration
 - (b) Carcinoma :
 - : Sessile, irregular stunted villi
 - : Infiltration
- (30) A growth covered by phosphates is generally malignant and resembles a stone
- (31) Special procedures in bladder papilloma
 - (a) Protection of incision margins
 - (b) Use of diathermy
 - (c) Silver nitrate instillations
 - (d) Repeated cystoscopic inspections.
- (32) *Growth of the bladder felt per rectum is never innocent.*
- (33) A patient must be cystoscoped at 3 monthly → 6 monthly → yearly → 2 yearly intervals for the rest of his life after an operation for removal of urinary papilloma.
- (34) *Every urinary papilloma case should be kept under cystoscopic observation*

- (35) Bilateral ureterostomy just medial to anterior superior iliac spine is no greater inconvenience than a colostomy
- (36) Do not allow tumour cells to come in contact with incision margins in operation for urinary papilloma
- (37) *Bladder stones in order of frequency*
 - (a) *Uric acid polished*
 - (b) *Phosphates chalky*
 - (c) *Calcium oxalate mulberry*
- (38) The most common site for a bladder growth or diverticulum is above and external to an ureteric orifice
- (39) Bladder stone in children
 - (a) Crying micturition
 - (b) Penile erection
 - (c) Masturbation
 - (d) Ammoniacal left palm
- (40) *Bladder stone in children look for phimosis*
- (41) *Clinical picture of bladder stone*
 - (a) *Terminal dysuria*
 - (b) *Terminal hæmaturia*
 - (c) *Effect of work and rest*
- (42) Most common vesico intestinal fistula is between the bladder and the pelvic colon due to diverticulitis or malignancy
- (43) Causes of post operative suprapubic fistula
 - (a) Prolapse vesical mucosa
 - (b) Unrelieved distal obstruction
 - (c) Overlooked infected diverticulum
- (44) One of the earliest signs of tubes dorsalis is trabeculation of the bladder
- (45) Majority of diverticulæ are situated above and external to one or other of the ureteric orifices
- (46) When prostatic enlargement and a diverticulum co exist, excision of the diverticulum with cystostomy should precede prostatectomy
- (47) Principal cause of death in carcinoma bladder is ascending pyelonephritis.
- (48) *Open cystostomy should never be carried out in the presence of acute urinary retention as it is extremely liable to produce anuria due to sudden decompression*
- (49) *In acute retention, always decompress slowly*
 - (a) *Letting out 4 ounces every hour*
 - (b) *Kidd's U tube*
- (50) *Avoid injury to peritoneum in bladder operations*
 - (a) *Trendelenburg position + Good anaesthesia*
 - (b) *Distension of the bladder*
 - (c) *Delicate dissection of peritoneum off bladder*

(b) Ventral epigastric or umbilical hernia

(a) Aggravation on lying down

(β) Relief by standing

(65) *Pure uric acid stones cast no shadows*

(66) *Unhealing suprapubic fistula nearly always denotes urethral obstruction*

(67) *Causes of vesico intestinal fistula*

(a) Appendicular abscess

(b) Diverticulitis

(c) Regional ileitis

(d) Carcinoma

(e) Congenital rectal abnormality

(68) *Remember bladder in direct inguinal herniotomies*

(69) *It is criminal not to examine for kidney efficiency before any genito urinary operation, especially for a long standing urinary trouble*

(70) *Sudden evacuation of bladder is disastrous in acute urinary retention, always decompress gradually*

(71) *Urinary drainage, suprapubic or urethral and hydrotherapy with diuretics are the measures to be adopted in renal inefficiency*

(72) *Acute urinary retention is best relieved by conservative methods*

(73) *Drainage removal*

(a) Pre vesical 3rd day

(b) Vesical (a) Suprapubic 7th day

(β) Urethral 10th day

(74) *Most usual post operative complications after any urinary operation*

(a) Ascending urinary sepsis

(b) Anuria with uræmia

(c) Chest complications

(d) Delirium nervosum

(75) *Do not forget to be sure that there are no multiple stones in the bladder*

(a) Inspect the stone

(a) Fracture

(β) Facets

(b) Explore the bladder

(c) Explore the prostatic urethra

(d) Explore the ureteric orifices

(e) Explore the diverticulum if present.

(76) *Do not forget to empty the bladder before opening it, always protect the peritoneum by a towel*

- (77) Anchor sutures in the bladder wall are useful as
 (a) Hæmostats under run veins
 (b) Retractors and pullers
 Get a bite of muscular coat only.
- (78) Catheterisation should never be performed without.
 (a) Cleansing the glans
 (b) Irrigating the urethra
 (c) Surgically clean hands
 (d) Sterile instruments
 (e) Sterile lubricant
- (79) After acute urinary retention has been relieved, the patient must be kept in bed for at least 12 hours
- (80) Sudden relief of acute retention or of chronic retention with overflow is catastrophic, gradual decompression of the bladder must be an inviolable rule in such cases
- (81) Indications for presacral neurectomy
 (a) Hydro ureter
 (b) Bladder paralysis
 (c) Intolerably painful cystitis
- (82) Deep X Ray therapy and radium therapy for malignant bladder have been dismal failures
- (83) Classification of epithelial tumours of the bladder.
 (a) Papillary
 (b) Papillary + infiltrating
 (c) Infiltrating
- (84) Transient hæmaturia is the first sign of a bladder tumour
 Pain is not a symptom of early cancer, it usually means 'too late'
- (85) Pain is the prominent feature of urinary stone; hæmaturia is the prominent feature of urinary growth
- (86) If sodium bicarbonate is added to cocaine hydrochloride, the anæsthetic action is increased at least six folds, due to ready dissociation of cocaine bicarbonate formed
- (87) Summary of catheter scales
 (a) French 21 (circumference in millimetres)
 (b) American 14 (2/3rd the French)
 (c) English 12 (2 less than American)
- (88) In any given case, the catheter which should be used is the largest which can be used, work downwards from instruments which are too large until one which will pass is reached
- (89) Size of normal adult urethra
 (a) English: 12
 (b) French: 21.
- (90) There is a close relationship between the circumference of the penis and the urethral lumen

Sgn Urethrogram

Treat Excision

(5) URETHROCELE

Etio Females

Site Urethro-vaginal septum (inferior wall)

Clinic (a) Tender swelling in vagina

(b) Frequent painful micturition

(c) Incomplete evacuation of bladder

(d) Excoriation of vulva due to overflow

(e) Painful and difficult coitus

Diag Cysto urethrogram

Treat Simple incision of the pouch

(4) DOUBLE URETHRA Rare

(5) PROLAPSE URETHRA

(6) EPISPADIAS

Def Congenital deformity of urethra and penis in which the urethra opens on the dorsum of the cleft penis

Varieties (1) Epispadias glandis rare

(2) Epispadias penalis rare

(3) Complete epispadias + ectopia vesicae

Clinic An open urethral gutter on the dorsum of the penis

Path Hypospadias with torsion of the penis?

Association (a) Rudimentary penis

(b) Mal-descent of testis

(c) Cleft scrotum

(d) Non united symphysis

(e) Inguinal hernia

Compl (1) Incontinence

(2) Urine irritation

(3) Ascending urinary infection

(4) Pseudo hermaphroditism

Treat Plastic operations

(1) Cantwell (Carson's Operative Surgery, Vol. II)

(2) Thompson provision of sphincter

(7) HYPOSPADIAS

Def (a) Arrested development of urethra

↓ (b) Failure in the formation of urethral floor

↓ (c) *Premature urethral opening on the under surface of penile body*

Varieties (A) Hypospadias glandis

Cause Failure of meeting between

(a) Epithelial invagination of glans

& (b) Uro-genital sinus urethra

Clinic Urethral opening at the glans base

Compl (a) Meatal stenosis

(b) Hooded prepuce

(B) Hypospadias penis.

Cause Arrested development of uro genital sinus

- Clinic (1) Urethral opening at peno scrotal junct.
 (2) Moist red furrow on penile under surface
 (3) Bent under developed penis
- Compl (a) Difficult micturition
 (b) Eczema scrotum
 (c) Sterility mechanical

(C) **Hypospadias perinealis :**

- Cause Arrested development of urogenital sinus
- Association (a) Undescended testis
 (b) Cleft scrotum
 (c) Rudimentary penis
- Clinic **External pseudo-hermaphroditism :**
 (a) Appearance of female genitalia
 (b) Urethral opening in the perineum
- Compl (1) Psychic and mechanical impotence
 (2) Squatting micturition

Complication of hypospadias in general

- (1) **Meatal stricture :**
 (a) Back pressure
 (b) Sepsis
 (c) Calculus
 (d) Straining syndrome hernia and piles
- (2) **Difficult micturition :**
 (a) Scrotum wetting
 Hypospadias penis
 (b) Squatting micturition
 Hypospadias perinealis
- (3) **Sterility and difficult coitus :**
 (a) Mechanical
 Hypospadias penis
 (b) Functional + mechanical.
 Hypospadias perinealis

Treat. (A) Hypospadias glandis :

Requires no treatment

(B) Hypospadias penis :

- (1) **Straightening of penis :**
 . By division of band
- (2) **Suprapubic cystostomy :** Preliminary
- (3) **Plastic operations .**

(a) **Bucknall :**

- Tech (a) Implant penis on scrotum
 (b) Detach penis from scrotum :
 With : Scrotal skin as under surface
 Age : 8-9 years

(b) Winsbury White :

Tech (a) Transplantation of preputial
muc. mem on to the front
of scrotum by pedicle graft

↓ (β) Bucknall

Steps (1) Transplantation of half of prepuce
with muc. mem. up, to a raw
margin in scrotum

↓ (2) Transplantation of whole prepuce
with muc mem up, to the front
of the scrotum

↓ (3) Implantation of penis to the trans-
planted foreskin

↓ (4) Detachment of penis from the front
of the scrotum, with its re-
constructed urethra

↓ (5) Obliteration of raw surfaces

Age 4 years

(c) Edmund

(C) Hypospadias perinealis .

Leave alone

(8) CONGENITAL OBSTRUCTION IN FEMALE URETHRA

(A) Diaphragm and valve

Cause Persistence of cloacal membrane

Site External orifice

Compl Back pressure

Treat (a) Incision

(b) Rupture with a sound

After treat Intermittent dilatation

(B) Stricture

Site External meatus

Clinic Frequent micturition

Compl Back pressure

Treat Meatotomy

After-treat Intermittent dilatation

(II) URETHRAL TRAUMA :

(1) URETHRAL WOUNDS

Varieties (A) From within . *False passage*

Etio (1) Faulty catheterisation

(2) Urethral obstruction

(a) Stricture

(b) Enlarged prostate

Clinic (a) Obstruction to the catheter

↓ (b) Application of force

↓ (c) Sudden swift painful progress

↓ (d) Hemorrhage + no urine

+ (e) Impaction of the catheter

(B) From without :

Etio : Gunshot or stab wounds

Site : Penile or bulbous portion

- Compl : (1) Urethral shock
 (2) Urethral hæmorrhage
 (3) Extravasation of urine
 (4) Urinary sepsis
 (5) Urethral stricture

- Treat : (A) Tie in a catheter : for 4 days
 (B) External urethrotomy + suture over catheter
 (C) Suprapubic cystostomy :

- Ind : (a) Severe injuries
 (β) Extravasation of urine

(2) RUPTURE URETHRA :

- Etio . (a) Erections penile urethra
 (b) Falls on perineum : bulbous urethra
 (c) Fracture pelvis : Membranous urethra

- Types . (A) Total rupture : through all coats
 (B) Subtotal rupture .
 (a) Interstitial corpus
 (b) External . sheath
 (c) Internal . mucous membrane

- (A) **Complete** : Whole circumference
 (B) **Incomplete or partial** : part of the circum.

- Sites : (1) Penile } . **extra-pelvic**
 (2) Bulbous }
 (3) Membranous **intra-pelvic**

- Clinic . (1) History of trauma .
 (a) Blow on perineum . bulbous
 (b) Fracture pelvis . membranous
 (2) Signs and symptoms .
 (A) Penile urethra .
 : Hæmorrhage independent of mict.
 (B) Bulbous urethra :
 (a) **Independent urethral hæmorrh.**
 (b) **Perineal hæmatoma**
 (c) Painful retention of urine
 (d) Difficult or failed catheterisation
 (e) **Superficial extravasation of urine**
 (C) Membranous urethra :
 (a) **Hæmorrhage with urine only**
 (b) **No perineal hæmatoma**
 (c) Painful retention of urine
 (d) Difficult or failed catheterisation
 (e) **Deep extravasation of urine**
 (f) Rigid lower abdomen
 (g) P. R. : tender painful swelling

- Diff diag (A) *Anterior urethra*
 (a) Continuous hæmorrhage
 (b) Distended bladder
 (c) **Perineal hæmatoma**
 (d) Superficial extravasation
 (e) Difficult catheterisation
- (B) *Posterior urethra*
 (a) Micturition hæmorrhage
 (b) **Distended bladder**
 (c) P R tender swelling
 (d) Deep extravasation
 (e) Difficult catheterisation
- (C) *Extraperitoneal bladder rupture*
 (a) No independent hæmorrhage
 (b) Non distended bladder
 (c) P R negative
 (d) Deep extravasation
 (e) **Easy catheterisation**,
 With bloody urine
- Compl (1) **Shock**
 (2) **Acute urinary retention**
 (3) **Extravasation of urine**
 (A) Superficial
 (a) Penile urethra
 (β) Bulbous urethra
 (B) Deep
 (a) Membranous urethra
 (β) Extraperitoneal bladder rupture
- (4) **Sepsis**
 (a) Cellular (a) Superficial
 (β) Deep
 (b) Ascending urinary
 (c) General septicæmia
- (5) *Stricture occlusion*
 (6) *Fistulæ*
- Treat (1) *Warn the patient not to micturate*
 ↓ (2) *Pass in a catheter in operation theatre*
 (A) If successful tie it in
 (B) If unsuccessful
 (a) Cystostomy and retrograde catheter
 (b) Antegrade catheter
 (c) Perineal exposure of both catheters
 (d) Guide in the antegrade catheter
- ↓ (3) *Suture of the urethra over the catheter*
 In complete rupture
- ↓ (4) *Treat the extravasation of urine*

↓ (5) *Suprapubic drain :*

- (a) Vesical
- (b) Retzius

(A) *Extrapelvic : bulbous and penile urethra*

(a) *Incomplete rupture :*

- (1) Perineal exposure
- (2) Evacuation of hæmatoma
- (3) Antegrade catheterisation :
: Suture urethra over it
- or (3) **Suprapubic cystostomy**
- (4) Treatment of extravasation

(b) *Complete rupture .*

- (1) Suprapubic cystostomy
- (2) Retrograde and antegrade catheters
- (3) Perineal exposure of both catheters
- (4) Excision of damaged tissues :
· With interrupted sutures
- (5) Suture of the urethral roof only
- (6) Closure of the bladder : with
 - (α) Suprapubic de Pezzer
 - (β) Retzius drain

Difficulty · Non apposition of urethral ends :

- (α) Change from lithotomy posture
- (β) Mobilisation of corpus spongios.

After-treat : (α) Suprapubic de Pezzer out :

· On 14th day

- (β) Irrigations of perineal wound .
For two weeks

(γ) Ant urethroscopy + dilatation :
After two weeks

(B) *Intrapelvic : membranous urethra*

- (1) Suprapubic cystotomy
- (2) Exposure of Retzius cave
- (3) Retrograde catheterisation :
No 21 French or no. 12 English rubber

↓ (a) *Incomplete rupture :*

: Draw in an antegrade catheter by
tying it to retrograde catheter

(b) *Complete rupture :*

- (4) Perineal exposure of retrograde catheter
- (5) Debridement of lacerated tissues
- (6) Antegrade catheter upto perineal wound
- (7) Tie together both catheters
- (8) Guide antegrade catheter into bladder :
 - (α) Attach a thread to the tip
 - (β) Bring it out through cystostomy

- (9) Suprapubic closure: with
 - (a) Catheter thread through cystostomy tube
 - (b) Retzius drain
- (10) Perineal wound packing
- After treat (1) Bladder lavage: B. D.
- (2) Change of catheter. every 4 days
 - (a) Tie new catheter to outer end of indwelling catheter
 - ↓ (b) Pull on the thread through suprapubic tube
- (3) Prevesical tube. out on 5th day
- (4) Suprapubic tube & indwell. catheter: Out on 14th day
- (5) Intermittent dilatation: after 6 weeks

- (C) *Rupture urethra with extravasation urine:*
 - (1) Preliminary cystotomy
 - (2) Retrograde catheterisation
 - (3) Perineal section
 - (4) Antegrade catheterisation
 - (5) Union of two catheters
 - (6) Antegrade catheter guided into bladder
 - (7) Drains
 - (a) Vesical drain
 - (b) Retzius drain
 - (c) Perineal wound unstitched
 - (8) Multiple incisions in extravasated tissues

After treat Remove the catheter at the end of 48 hours

(3) FOREIGN BODIES URETHRA

- Etio. (1) Sexual aberrations
- (2) Accidental insertions children
- (3) Auto treatment of retention urine
- (4) **Impacted calculus**
- Sites. (a) Fossa navicularis
- (b) Bulbous urethra
- Clinic: (1) History or no history
- (2) Urethral discharge
- (3) Urinary obstruction
- (4) **Palpation**
- (5) Signs of complications
- Compl: (a) **Acute retention**
- (b) Stone formation
- (c) Peri urethral abscess
- (d) Urethral fistula
- (e) Urethral stricture
- Treat: (1) **Extraction**
 - (a) Urethral forceps. near the ext. meatus

- Treat** **Conservative:** *No instrumentation*
 (a) Urinary antispasmodics and sedatives
 (b) Urinary antichemicals alkalies
 (c) Hydrotherapy and diuretics
 (d) Hot hip baths

(B) CHRONIC URETHRITIS

- Etio** (a) **Residual:** Sequela of acute
 (b) **Gonorrheal**
 (c) **Diabetic**
 (d) **Tuberculous** rare
 (e) **Septic basilluric**
 (f) **Granular** in women
- Clinic** (1) **Frequency** of micturition
 (2) **Dysuria**
- Compl** (1) **Exacerbations** of acute urethritis
 (2) Urinary retention
 (3) **Ascending infection:**
 (a) Urinary cystitis
 (b) Genital epididymo orchitis
- Treat** (1) **Conservative:**
 (a) Diuretics and hydrotherapy
 (b) Urinary antiseptics
 (c) Urinary antichemicals
 (2) **Instrumental:** *Not in complications*
 (a) Passage of bougies or sounds
 Urethral massage over them
 (b) Instillations of
 (a) Mercurochrome
 (β) Acriflavine
 (c) Endoscopic applications

(C) PERI URETHRITIS

- Etio** (1) **Trauma:** Rupture, false passage, F B
 (2) **Infection:** Urethritis
 (3) **Obstruction:** Stricture, stone
 (4) **New growths**
 (5) **Specific.** Bilharziasis
- Varieties** (I) **Chronic indurative peri urethritis**
 Peri urethral indurative fibrosis
 Associated with multiple fistulae
 (II) **Peri urethral abscess**
- Etio** (a) **Gonorrheal urethritis** Penile
 (b) **Stricture:** Bulbous
 (c) **Impacted stone**
- Clinic** (a) **Tender induration:**
 On penile under surface
 ↓ (b) **Fluctuating swelling**
 On penile under surface
 (c) **Retention of urine**
 (d) **Presence of etiology**

Compl. (1) **Extravasation of urine**

(2) **Urinary fistula**

Treatment (A) *Penile* :

(1) **Intra-urethral drainage** :

(a) Passage of a sound

or (b) Pass an urethroscope

(2) **Aspiration**

By syringe + needle

(B) *Bulbous* .

(1) **Aspiration**

or (2) **Perineal drainage**

+ (C) **Treatment of etiology** :

After the acute phase has subsided

After treat (1) **Antiseptic baths**

(2) **Intermittent dilatations**

(3) **Treatment of etiology**

(III) *Extravasation of urine*

Def. Infiltration of cellular tissues with urine, leading to cellulitis and gangrene or multiple urinary fistulae

Varieties (A) *Superficial or subcutaneous*

Etio (a) Rupture anterior urethra

(b) False passage

(c) Peri urethral abscess

Path Extravasation of urine into

(a) Superficial perineal pouch

(b) Scrotum and penis

(c) Lower abdominal wall

Extravasation does not enter

(a) Thighs

(b) Perianal area

Clinic (a) Signs of etiology

(b) Diffuse oedematous subcutaneous cellulitis

(c) General toxæmia

Compl (1) **Gangrene**

(2) **Septicæmia**

(3) **Urinary fistulae**

(4) **Chest complication**

(5) **Uræmia**

Treat (a) **Treatment of etiology** :

Rutherford's sutureless operation .

- (1) Suprapubic cystostomy
- (2) Retrograde catheter
- (3) Perineal section
- ↓ (b) **Urinary drainage:**
 - (1) Suprapubic Cystostomy
 - (2) Perineal in strictures
 - (3) Meatal Indwelling catheter
- ↓ (c) **Treat extravasation**
 - (1) *Multiple incisions*
 - (2) *Wounds irrigations H₂O₂ or Carrel Dakin*
- + (d) **General treat of sepsis:**
 - (1) Urinary sepsis Hexamine
 - (2) Cellulitis Sulphonamides
- + (e) **Treat renal failure:**
 - Due to back pressure
- + (f) **General supporting treat.**
 - Tonics, hæmatinics
- + (g) **Treat complications:**
 - As they appear
- (B) *Deep or intrapelvic*
- Eti (a) **Urethra:**
 - Intrapelvic rupture
- (b) **Bladder:**
 - (a) Extraperitoneal rupture
 - (β) Suprapubic puncture
- (c) **Ureter: Rupture**
- (e) **Retzius: Inefficient drain**
- Path Urinary infiltration of pelvic cellular tissues
- Clinic Diffuse submuscular induration in the hypogastric region, rising up from behind the symphysis pubis
- Compl (a) Pelvic cellulitis → abscesses → fistulæ
- (b) Septicæmia
- Treat (1) **Treatment of etiology**
- (2) **Urinary drainage:**
 - (a) Suprapubic cystostomy
 - (b) Retzius drain

(c) Indwelling catheter

(d) Perineal drain

(3) Multiple incisions

(4) Other treatment as in (A)

Operative treatment for extravasation of urine :

(1) Spinal anaesthesia

(2) Bougie or Cock's operation

(3) Lithotomy position

(4) External urethrotomy

(5) Bladder drain

(6) Multiple incisions :

: Into infiltrated tissues

After-treat. (a) Irrigations :

(a) Hydrogen peroxide

(β) Carrel—KMnO₄

(b) Intravenous therapy :

(a) Drip sodium sulphate

(β) Glucose saline

(c) Intermittent dilatation of stricture

(IV) URETHRAL STRICTURE :

Def : Narrowing of the lumen of the urethra

Etio : (1) **Congenital :**(a) *Pin point meatus*

(b) Any other part

(2) **Inflammatory :** Congestion + spasm

(a) Urethral congestion

(b) Acute urethritis :

. Over a chronic focus (stricture)

(c) *Chronic urethritis :* Infiltration: *Chronic gonorrhœa*(3) **Traumatic :**(a) *False passage*(b) *Rupture*

(c) Impacted foreign body

(d) *Post operative .*

(a) Prostatectomy

(β) Penisectomy

(e) *Tied-in catheter*(4) **Ulcerative :**

: Impacted stone or F. B.

(5) **New growths :**

: Carcinoma

(6) **Spasmodic :**

(a) Nervous

(β) Inflammatory

Morb anat. (A) *Shape* .

- (a) Linear
- (b) Annular
- (c) Tortuous
- (d) Bridle

(B) *Consistency*

- (a) Resilient
- (b) Indurative
- (c) Cartilaginous

(C) *Clinical*

- (a) Irritable
 - (b) Passable
 - (c) Impassable
 - (d) Impermeable
- } to instruments
to urine

Sites (A) Congenital

External meatus

(B) *Gonorrheal multiple*

- (a) Bulbous urethra
- (b) Penoscrotal junction
- (c) Distal end

(C) False passage

- (a) Bulbous urethra
- (b) Prostatic urethra
- (c) Distal to stricture

(D) Rupture single

- (a) Bulbous urethra
- (b) Prostatomembranous junction

(E) Post operative at the site of operation

(F) Stone at the site of impaction

(G) Tied in catheter penoscrotal junction

Path (a) Congestion

- ↓ (b) Soft infiltration
- ↓ (c) Hard infiltration
- ↓ (d) Fibrosis
- ↓ (e) Stricture

Clinic (1) **Chronic urethritis syndrome**

Urethral discharge

(2) **Dysuria Straining at micturition**

- + (a) Back pressure syndrome
- or (b) Ascending infection syndrome

(3) Palpation of urethral floor

(4) **Sounding:**

- (a) Catheter
 - (α) Rubber
 - (β) Gum elastic
 - (γ) Metal
- (b) Sounds metal
- (c) Bougies
 - (α) Gum elastic
 - (β) Fishform

- (5) Urine examination
 - (a) Ordinary
 - (b) After prostatic and urethral massage
- (6) Urethrography
- (7) Urethroscopy

Compl. (1) *Acute and chronic retention*

(2) *False incontinence*

(3) *Back pressure*

(a) Proximal hypertrophy

↓ (b) Proximal dilatation

↓ (c) Proximal functional failure

↓ (d) Uræmia

(4) *Ascending infection*

(a) Urinary cystitis → pyelitis

(b) Genital epididymo orchitis

(5) **Stone formation :**

(a) Urethral

(b) Proximal vesical, renal

(6) **Local sepsis :** Peri urethritis → abscess

(7) **Extravasation urine**

(8) **Urinary fistulæ**

(9) **Malignancy**

(10) **Extra urinary gonorrhœal rheumatism**

(11) *Treatment complications*

(a) Urethral shock

(b) **Urethral sepsis**

(c) **Urethral trauma :** False passage

(d) Urethral hæmorrhage

(e) Extravasation urine

(f) Anuria

(12) **Strain syndrome :**

(a) Inguinal hernia

(b) Hæmorrhoids

(c) Prolapse rectum

Treatment (A) *Conservative treatment*

Ind Acute congestive retention

Tech (1) Hot hip bath

(2) Sedatives

(B) *Instrumental treatment Dilatations*

Ind No acute complications

Contra Acute congestive or spastic retention

Anæsth. (a) **Urethral**

(b) Spinal

(c) General

Tech (1) **Intermittent :** Weekly

(2) **Rapid :** Preliminary to (3)

- (3) **Continuous :**
 Bougies \rightarrow sounds \rightarrow catheters
 Tied in the urethra
 Changed for next numbers
- Instr (1) **Gum elastic bougies** - French
 (2) **Lister's metal sounds**
 (3) **Catheters :** Gum elastic and metal
 (4) **Filiform bougies ; Faggot method**
 (5) **Kollmann's dilators** In later stages
- N B* Do not anaesthetise the urethra
- Compl Rupture urethra \rightarrow extravasation
- Compl (a) Urethral shock
 (b) Urethral fever
 (c) False passage
 (a) Haemorrhage
 (β) Extravasation
 (d) Ascending sepsis
 (e) Anuria \rightarrow uraemia
- Preparation (a) Urinary antiseptics
 (b) Diuretics and hydrotherapy
- Steps (1) *Large calibre stricture* $> 20^{\circ}$ *charriere*
 (A) **Kollmann's dilator technique :**
 (a) At weekly intervals
 (b) At a sitting
 (a) 2° for under 30 *charriere*
 (β) 1° „ between 30-40 ch
 (γ) $\frac{1}{2}^{\circ}$ over 40 *charriere*
 ↓ (B) **Bladder lavage**
 (a) Acriflavine 1-8000
 (β) Mercury oxycyanide 1-8000
- (2) *Small calibre stricture* $< 20^{\circ}$ *charriere*
- Treat (1) Preliminary instrumental or operative
 ↓ (2) Kollmann dilator
- Tech (1) **Instrumental dilatation :**
 (a) **Intermittent weekly**
 (1) *Bougie dilatation*
 (2) *Steel sound dilatation*
 Ind Dense strictures
 (3) *Guides and followers*
 (a) Urethral lubrication
 Olive oil instillation
 (β) Faggot method
 (γ) Urethroscopic guidance
 (b) **Continuous dilatation**
- Tech *Catheters of increasing calibre*
 : Tied in continuously

- Compl : (α) Ascending infection
 (β) Reflex anuria
 (γ) Urethral ulceration :
 (1) Stricture
 (2) Fistula

↓ (2) Kollmann's dilator technique :
 . After calibre $> 20^{\circ}$ charriere

(C) Operative treatment :

Ind. (1) Cases unsuitable for dilatation .

(a) Impassable stricture

(b) Complications :

(α) Urethral :

(1) Irritability

(2) Hæmorrhage

(3) False passage

(4) Extravasation

(5) Recurrent retention

(6) Peri urethral abscess

(7) Urethral fistula

(8) Calculus

(β) Back pressure

(γ) Ascending infection

(c) Secondary stricture :

Growth

(2) Failure of dilatation .

(a) Cartilaginous stricture

(b) Resilient stricture

(c) Recurrent stricture

(d) Multiple strictures

(3) Inability or unwillingness to undergo dilatation treatment

Operations. (1) Internal urethrotomy : (See under Operations)

Ind : *Passable uncomplicated* stricture .

. (esp resilient, cartilaginous and multiple)

(2) External urethrotomy : (See under Operations)

Ind (a) *Passable complicated* stricture

(b) *Impassable* stricture

Tech : (a) *Passable complicated :*

: **Syme :** With a guide

: **Fergusson**

(b) *Impassable :*

(α) **Wheelhouse :** Staff

(β) **Cock :** Blind operation

(γ) **Perineal dissection :**

: Of proximal dilated urethra

(δ) **Retrograde catheter :**

(1) Cystostomic introduction

(2) Perineal exposure

(3) Suprapubic cystostomy •

- Ind (a) *Preliminary* to stricture operations
 (b) *Emergency* measure in
 (1) Renal failure
 (2) Peri-urethral suppuration
 (3) Extravasation urine
 (4) Impassable stricture
 (5) False passage
 (6) Ascending infection

Contraind *Acute or chronic retention*

- After treat (a) Retrograde catheterisation
 (b) Instrumental dilatation of stricture
 (c) Operative treatment of stricture

(4) Excision of the stricture

Ind Single indurated, complicated, traumatic stricture less than one inch long

- Contra (a) Stricture > one inch
 (b) Multiple strictures
 (c) Infective strictures

- Post compl (1) Anuria with uræmia
 (2) Ascending urinary sepsis
 (3) *Urinary fistulæ*
 (4) **Recurrent stricture**

- After treat (1) Urinary diluents and antiseptics
 (2) **Prolonged intermittent dilatation**

(V) URETHRAL FISTULÆ:

Def Abnormal tract conveying and discharging urine

Etio (1) *Congenital*

- (a) Epispadias
 (b) Hypospadias

(2) *Acquired*

(a) **Traumatic:**

- (a) Rupture urethra
 (β) False passage
 (γ) Catheter slough
 (δ) Perineal operations

(b) **Inflammatory •**

- (a) Peri urethral abscess
 (β) Extravasation of urine

(c) **Obstructive .**

- (a) Stricture
 (β) Stone impacted
 (γ) New growth

(d) **New growth:**

Carcinoma

(e) **Specific :**

Bilharziasis

Clinic Sinus discharging urine :

(a) Smell

(b) Chemical examination

(c) **Chromo diagnosis :**

Injection of methylene blue

Treat (a) **Treatment of etiology :**

(α) Removal of obstruction

(β) Treatment of infection

(γ) Removal of irritation

(b) **Suprapubic cystostomy :**

↓ Perineal dissection

↓ Excision of the fistulous tract

↓ Packing

(c) **Plastic operations****(VI) NEW GROWTHS OF THE URETHRA :**(A) *Benign*

(1) Papilloma

Etio (a) Simple

(b) Specific Bilharzial

Clinic (1) Chronic urethral discharge

(2) Urethral hæmorrhage

(3) Urinary obstruction

Treat (a) Diathermic excision

(b) Urethroscopic removal

(2) Caruncle

Etio Female urethra

Cause Urethritis

Clinic (a) Painful hæmorrhage

(b) Painful micturition

(c) Painful coitus

(d) Bleeding micturition

(e) Small red, fleshy tumour

At the external meatus

Treat (a) Diathermy excision

(b) Treatment of urethritis

Compl Recurrence

(3) Urethral cysts

Etio (a) Congenital pouch

(b) Blocked Littre's gland

(c) Blocked Cowper's gland

(B) *Malignant* Carcinoma urethra

Etio (1) Trauma

(2) Leukoplakia

(3) Stricture

Site Bulbous urethra

Morb anat	Squamous celled
Clinic	(a) Pus or blood per urethrum
	(b) Urinary obstruction
	(c) Urethral
	(α) Growth
	(β) Stricture
	(γ) Fistula
	} indurated
	(d) Profuse bleeding on catheterisation
	(e) Urethroscopy
	(f) Secondaries
	(α) Groin glands
	(β) Lungs liver
Compl	(1) Haemorrhage
	(2) Stricture → urinary obstruction
	(3) Urinary sepsis
	(a) Local abscess → fistula
	(b) Ascending
	(4) Fistulae
Treat	(a) Amputation penis + excision glands
	(b) Radium

(VII) URETHRAL OPERATIONS :

Pre-operative measures

- (1) Kidney efficiency investigations
- (2) Blood and urine urea investigations

Pre-operative treatment

- (1) Diuretics and hydrotherapy
- (2) Urinary antiseptics

(1) MEATOTOMY

- Ind (a) Congenital pin hole meatus
(b) Stricture external meatus

- Steps (a) Novocain infiltration of frænum
(b) Enlargement of meatus
By scissors cut
To one side of frænum
(c) Mucous membrane—skin suture
Catgut oo

(2) INTERNAL URETHROTOMY

- Def Intra urethral incision of a stricture urethra
By an urethrotome

- Ind Passable uncomplicated local traumatic stricture

- Anæsth (a) Local urethral
(b) Spinal
(c) General

Prelim Urethral wash

- Oper (1) Introduction of filiform guide
↓ (2) Introduction of staff in mid line
↓ (3) Introduction of knife along the staff groove
↓ (4) Stricture cut
(a) Distalo-proximally
or (b) Proximo-distally

- ↓ (5) Withdrawal of knife staff and guide
- ↓ (6) Pass in sounds and dilate
- ↓ (7) Tie in a catheter and wash the bladder

Difficulties (a) Impassable stricture
 (b) Retention of guide in the bladder
 (c) Failure to pass a metal sound

(3) EXTERNAL URETHROTOMY

Def External incision of stricture urethra by perineal route

Ind (A) Passable complicated stricture

Syme's operation

(B) Impassable stricture

(a) Wheelhouse's operation

(b) Cock's operation

(c) Perineal dissection

(d) Suprapubic retrograde catheter

Tech (A) Syme's operation

Ind Passable stricture with fistulae

Steps (a) Introduction of Syme's staff

(b) Fixation in mid line

(c) Incision on the staff

(d) Incision of the distal urethra

(e) Incision of the stricture

(f) Incision of the proximal urethra

(g) Introduction of Teale's gorget

(h) Pass in a rubber tube & drain urine

(i) Tie in the bladder rubber tube in perineum

After treat (1) Removal of the perineal tube after 4 days

↓ (2) Passage of a steel sound after 7 days

↓ (3) Indwelling catheter for 10 days

↓ (4) Intermittent dilatation

(B) Wheelhouse's operation

Ind (a) Impassable stricture

(b) Removal of calculus or F B

Steps (a) Pass in Wheelhouse's staff (or a rubber catheter)
 Upto the stricture

(b) Incision of the urethra

$\frac{1}{2}$ inch distal to the stricture by a longitudinal or curved transverse incision

(c) Pick up the urethral muc mem

(d) Turn the staff & retract, or use the catheter loop

(e) Search for proximal lumen

(f) Pass in a probe

(g) Incision of the stricture distalo proximally

(h) Pass in a gorget

(i) Guide in a catheter

(α) From ext meatus to perineal wound

↓ (β) From perineal wound to bladder

(j) Suture the perineal wound

With a glove or slit rubber drain

- After treat (1) Removal of the catheter after 10 days
 (2) Passage of steel sound after 14 days

If Wheelhouse fails

(C) Perineal dissection of proximal urethra

(D) Cock's operation

Def External urethrotomy without a guide

Ind (a) Multiple fistulae

(b) Acute retention

(c) Extravasation of urine

(d) Failure of Wheelhouse

Steps (a) Lithotomy median position

(b) Rectal finger at prostate tip

(c) Stab at perineal central point

(d) Open the dilated prostatic urethra

(e) Pass in Teale's gorget

(f) Pass in a catheter

(g) Cut the stricture proximo-distally

(h) Tie in the catheter in perineum

(E) Suprapubic retrograde catheter

↓ Perineal exposure

(4) EXCISION OF URETHRAL STRICTURE

Ind Hard indurated tubular stricture less than 1"

Contra (a) Stricture > 1"

(b) Multiple strictures

Steps (a) Preliminary suprapubic cystostomy
 14 days before

(b) Retrograde sound

(c) Incision of bulbocavernosus

Exposure of bulbous urethra

(d) Excision of stricture and indurated tissues
 Not more than 1.5"

(e) Suture of the urethra over a bougie esp the roof

(a) Change of lithotomy into straight posture

(b) Mobilisation of corpus spongiosum

(f) Perineal drain

Post-operative treatment after urethral operations

(A) Local

(1) Removal of the perineal or meatal catheter
 10th day

↓ (2) Passage of a sound
 14th day

↓ (3) Intermittent urethral dilatation Weekly

(4) Bladder washes B D
 First three days

(5) Hot permanganate hip baths
 After four days

(B) General

(1) Diuretics and hydrotherapy

(2) Urinary antiseptics

Post-operative complications

- (1) Urethral shock
- (2) Urethral fever
- (3) Urethral hæmorrhage
- (4) Urinary obstruction retention
- (5) Local sepsis
 - (a) Peri urethral abscess
 - (b) Extravasation
 - (c) Fistula
- (6) Ascending sepsis
 - (a) Urinary pyelitis
 - (b) Genital epididymo-orchitis
 - (c) General septicæmia
- (7) Renal failure
- (8) Recurrence of stricture
- (9) Delirium nervosum

(VIII) IMPORTANT POINTS

- (1) External urinary meatus is the narrowest part of male urethra and normally admits 25 30 Charrière
- (2) Hypospadias glandis is the most common variety of hypospadias complete epispadias is the most common variety of epispadias, and is accompanied by ectopia vesicæ and rudimentary development of external genitalia.
- (3) Sequelæ of complete intrapelvic rupture of urethra
 - (a) Impermeable stricture
 - (b) Suprapubic fistula
- (4) Plastic operations for hypospadias
 - (a) Bucknall
Floor formed by anterior scrotal skin
 - (b) Winsbury White
Floor formed by mucous aspect of transplanted fore-skin
- (5) *Never pass fine pointed and slender metal catheters or sounds in the urethra*
- (6) *The first principle in treatment of all intrapelvic and the majority of extrapelvic ruptures is the immediate performance of supra pubic cystostomy under full anaesthesia, to divert urinary stream and/or check further extravasation.*
- (7) *The sutureless operation is without doubt the operation of choice when extravasation has occurred, for suturing is technically impossible in the presence of infection or extravasation*
- (8) *Etiology of rupture urethra*
 - (a) Anterior falls astride perineum
 - (b) Posterior fracture pelvis
- (9) *Catheterise on suspicion of urethral rupture*
 - (a) Incomplete rupture
Catheter passes on with some difficulty

(b) Complete rupture .

Catheterisation impossible

- (10) *Under no circumstances should the patient attempt to micturate if urethral rupture is suspected.*
- (11) *In complete rupture of urethra, unless intrapelvic, no catheter is tied in the urethra after its exposure and suture, as it predisposes to traumatic stricture*
- (12) *Every rupture or false passage of the urethra, even the slightest, is a potential stricture*
- (13) *Bulbous urethral rupture syndrome .*
 - (a) Urethral independent hæmorrhage
 - (b) Perineal hæmatoma
 - (c) Retention of urine
 - (d) Pain
- (14) *Promiscuous catheterisation with only ordinary precautions must be abolished*
- (15) *Extrapelvic rupture should have no indwelling catheter, which is necessary in intrapelvic rupture*
- (16) *Whilst the gap between the ends of the urethra may be considerable when the patient is in lithotomy position, yet when the legs are extended, probably the urethral ends will be in contact*
- (17) *Investigations in a suspected case of rupture urethra should always be done in operation theatre*
- (18) *Immediate treatment of intrapelvic rupture of urethra .*
 - (a) *Suprapubic cystostomy*
 - + (b) *Retzius drain*
 - + (c) *Correction of backward displacement of bladder neck .*
By Indwelling antegrade catheter guided by retrograde one
- (19) *If the bladder is even moderately distended, the lesion must be situated at or below the vesical sphincter.*
- (20) *Principal indication for an indwelling catheter in urethral injuries is intrapelvic urethral rupture*
- (21) *Membranous urethra, unlike the bulbous, shows very little tendency to stricture formation*
- (22) *Common complications of catheterisation or instrumentation :*
 - (1) *Urethral fever*
 - (2) *False passage*
 - (a) Hæmorrhage
 - (b) Extravasation
 - (c) Stricture
 - (3) *Ascending infection*
 - (a) Cystitis → pyelitis
 - (b) Orchitis

- (23) Harry Bank's two metal catheters method of guiding a catheter past intrapelvic complete rupture of urethra and then drawing out a self retaining catheter through suprapubic opening
- (24) In every case of rupture bladder where peritoneal soiling is suspected, open the peritoneum first and explore the pelvis.
- (25) *Two great indications in the treatment of urinary extravasation are**
- (a) *To mitigate blood infection*
 - (α) *Multiple incisions*
 - (β) *Hydrogen peroxide or permanganate dressings*
 - (b) *To combat uræmia*
 - (α) *Bladder drainage*
 - (β) *Sod sulphate drip with saline*
- (26) In cases of dense traumatic stricture following rupture of bulbous urethra, complete excision of the stricture is often the best treatment
- (27) *In cases of acute retention* due to stricture of the urethra, a fine gum elastic filiform bougie can often be passed, if necessary by *faggot method*, and urine trickles down by its side.
- (28) Traumatic rupture of the urethra constitutes about 20% of all urethral strictures
- (29) Urethral stricture is most common among males between 25 and 45, and is usually the result of chronic gonorrhœal urethritis
- (30) *Gonorrhœal urethritis → soft infiltrations → hard infiltrations → fibrosis → strictures*
- (31) Complete rupture of the intrapelvic urethra, unless treated skilfully soon after the accident, leads to one of the most hopeless forms of urethral stricture
- (32) *Anæsthesia of the urethra*
- Ind Catheterisation in acute retention
 - Tech (1) 5% cocaine or 2% novocain
Drachms 2 injected by 10 c cs. syringe
 - (2) Clamp the meatus
For 5 minutes
- (33) Most resistant strictures are those of external meatus due to healed chancre.
- (34) Etiology of external meatal stricture
- (a) Congenital
 - (b) Phimosis
 - (c) Gonorrhœa
 - (d) Chancre
 - (e) Bad circumcision.

- (35) *Gonorrhœal strictures are usually multiple (75%); majority (66%) being situated in the bulb, while remainder are in penile portion. Prostatic and membranous portions are never affected*
- (36) Differential diagnosis between:
 - (A) Bladder neck obstruction.
 - (a) Delay in start
 - (b) Loss of projection + dribbling
 - (c) Ineffectual straining
 - (B) Stricture urethra.
 - (a) Small stream
 - (b) Good projection
 - (c) Effectual straining
- (37) *Easiest method of dilating a small bore stricture is to insert a filiform gum elastic guide*
- (38) Kollmann's dilator
 - (a) Closed 20° Charrière
 - (b) Fully open 45° Charrière at bulb
- (39) Stage of dilatation between 35° and 38° is difficult and should be regarded as critical
- (40) When full dilatation has been reached on three consecutive occasions without any resistance before 40° Charrière and with no bleeding, the intervals are gradually extended upto one year
- (41) Sterilisation of bougies is best done by hanging them in closed jars containing calcium chloride and formalin tablets for 12 hours.
- (42) Operation for stricture urethra should only be performed as a last resort after the failure of repeated instrumental methods
- (43) Passage of a guide through a stricture is much easier when attempted from the proximal side.
- (44) *Gonorrhœa leads to retention of urine from four causes:*
 - (a) Spasmodic + congestive stricture
 - (b) Acute prostatitis
 - (c) Peri urethral abscess
 - (d) Stricture urethra
- (45) *Complications of urethral obstruction.*
 - (a) Urinary back pressure.
 - (a) Hypertrophy → dilatation
 - (b) Functional failure → uræmia
 - (b) Sepsis:
 - (a) Local
 - (b) Ascending genito urinary
 - (c) Lithiasis:
 - (a) Local
 - (b) Proximal

- (d) *Fistulæ*
- (e) *Strain syndrome*
- (f) *Treatment complications :*
 - (1) Shock
 - (2) *False passage*
 - (3) Hæmorrhage
 - (4) Extravasation
 - (5) *Sepsis*
 - (6) Anuria
- (46) Before the introduction of a follower or internal urethrotomy staff, test their union with the guide; otherwise the guide will be left in the bladder on withdrawal of the instrument.
- (47) *In suture of the urethra, suture only the superior wall; leave the lateral walls and the floor unsutured. Do not tie in a catheter Drain suprapublically or perineally.*
- (48) *Most common injuries to urethra .*
 - (a) *Faulty catheterisation*
 - (b) *Falls or kicks on perineum*
 - (c) *Fracture pelvis*
- (49) *Most common complications of rupture urethra :*
 - (a) *Acute retention*
 - (b) *Extravasation*
 - (c) *Stricture*
- (50) *Exclude rupture urethra in every case of fracture pelvis.*
- (51) *Most common causes of urethral stricture .*
 - (a) *Gonorrhæal*
 - (b) *Traumatic*
- (52) *Common sites for stricture :*
 - (a) *External meatus*
 - (b) *Peno scrotal junction*
 - (c) *Bulb*
 - (d) *Prostato membranous junction*
- (53) *Intermittent dilatation for at least two years is necessary in stricture urethra, recurrence being very common*
- (54) *Fistulæ are less common after internal urethrotomy.*
- (55) *Fistulæ are common after tying in metal catheters, the complications of which are :*
 - (a) *Acute urethritis*
 - (b) *Peri urethral abscess*
 - (c) *Fistulæ . peno scrotal*
 - (d) *Ascending sepsis*
 - (e) *Anuria → uræmia*
- (56) *Most common causes of peri urethral abscess :*
 - (a) *Chronic gonorrhœa*
 - (b) *Impacted stone*
 - (c) *Indwelling catheter.*

(57) Extravasation of urine

- Path (A) Deep or intrapelvic or subsymphysis
 (B) Superficial or extrapelvic or suprasymphysis

- Etio (A) Traumatic rupture
 (B) Septic peri urethral abscess.

(58) *Most common causes of urethral fistulæ*

- (a) *Stricture*
 (b) *Peri urethral abscess*
 (c) *Impacted stone*
 (d) *Indwelling catheter*
 (e) *Bilharziasis*
 (f) *Carcinoma*

(59) Multiple urinary fistulæ

- (a) Extravasation urine
 (b) Carcinoma
 (c) Tuberculosis
 (d) Bilharziasis

(60) Late hæmorrhage after internal urethrotomy should be treated by

- (a) Suprapubic cystostomy
 + (b) Perineal section
 Pack with snake venom gauze
 + (c) Blood transfusion
-

CHAPTER VI

THE PROSTATE

(I) INFLAMMATIONS OF THE PROSTATE:

(A) *Acute inflammations:*

(1) ACUTE PROSTATITIS:

Etiology: (a) **Acute urethritis:**

(α) Gonorrhœal

(β) *B. coli*

(γ) Instrumentation

(b) Descending infection: pyelitis

Clinic: (a) **General signs of sepsis:**

: Septic toxæmia

(b) **Local signs of inflammation:**

: Perineal heaviness and tenderness

(c) **Reflex signs of inflammation:**

(α) Acute retention of urine

(β) Proctitis

(d) **Rectal examination:**

: Painful, tender, indurated mass

Diff. diag: (a) Cystitis

(b) Vesiculitis

(c) Posterior urethritis

Compl: (1) **Acute retention of urine**

(2) **Extension to vesicles and testes**

(3) **Prostatic abscess**

(4) **Chronic prostatitis**

Treat: (a) **Avoid all urethral instrumentation**

(b) **Fomentations:**

(α) Hot bag to the perineum

(β) Hot enema:

: With morphine suppository

(γ) Hot bag per rectum.

: Elliott treatment:

: (Med Ann 1939)

(δ) **Hot hip baths**

(c) **Urinary treatment:**

(α) Diuretics

(β) Antispasmodics: Tr. hyoscyamus

(γ) Antiseptics

(d) **General treatment of sepsis:**

: **Sulphonamides**

(2) ACUTE PROSTATIC ABSCESS

- Etio (a) Acute gonococcal prostatitis
 (b) Secondary urethral prostatitis
 Clinic (1) All signs of acute prostatitis.
 Persisting for **more than one week**
 (2) Pronounced septic toxemia
 (3) P R Tender fluctuation
 Compl (1) Bursting into (a) Rectum
 (b) Urethra
 ↓ (2) Recto urethral fistula
 Treat (a) Conservative (See above)
 ↓ (b) Drainage
 (a) Urethral passage of a catheter
 (β) Perineal
 (1) Exaggerated lithotomy position
 (2) Incision 1" in front of anus
 + ½" lateral to midline
 (3) Hilton's evacuation
 (4) Breaking the septa
 (5) Drainage tube

(B) *Chronic inflammations*

(1) CHRONIC PROSTATITIS

- Etio (A) Primary (a) Insidious
 (b) **Acute prostatitis**
 (B) Secondary (a) Chronic urethritis
 (b) **Genital sepsis**
 (a) Vesicles
 (β) Testes
 Bact (a) Colon bacillus
 (b) Staphylococcus
 (c) **Gonococcus**
 Clinic (1) Pain local or referred
 : **Prostate backache**
 (2) Perineal tenderness
 (3) **Urinary syndrome**: Obstruction
 (4) Genital syndrome emissions
 (5) Metastatic syndrome
 Synovitis, fibrositis
 Signs (1) Urethral discharge
 (2) Prostatic massage
 Threads and commas
 (3) Epididymo orchitis
 (4) Urine examination
 (5) Urethroscopy

Treat: (A) **Urethral**: Twice weekly

(a) Urethral dilatation

↓ (b) Seminal vesicular, prostatic and urethral **massage** over a sound:
: From above downwards

↓ (c) Urethral irrigations:

(a) Acriflavine: 1-8000

(β) Mercury oxycyanide. 1-8000

(B) **Rectal**: Diathermy

(C) **Vesical lavage**:

(a) Urethroscopic catheterisation:

: Of ejaculatory ducts

(b) Vasotomy: intra luminal injection of
5-10 c cs of 1% mercurochrome

(D) **Prostatic injections**:

(a) Intra prostatic injection:

: Of 5-10 c cs. of 1% mercurochrome

↓ (b) Prostatic massage

(E) **General**:

(a) Vaccine therapy

(b) Sulphonamide group

(c) Nervine tonics

(2) CHRONIC GONOCOCCAL PROSTATITIS:

Etio: Gleet

Clinic: (As under (1) above) + urethral smear

Compl: (1) Spread to genitals.
: Vesicles and testes

(2) Myositis, fibrositis and arthritis:
: Gonorrhoeal rheumatism

(3) Neurasthenia

Treat: (1) **Prostatic evacuation**:

Tech (a) Allow retention of urine

↓ (b) Pass a urethral sound

↓ (c) Rectal massage
: Of prostate and vesicles

↓ (d) Urethral massage
From above downwards

↓ (e) Removal of the sound

↓ (f) Evacuation of bladder

(2) Gonococcal vaccines

(3) Nervine tonics

(3) CHRONIC TUBERCULOUS PROSTATITIS:

Etio: Young adults

Predisp: Gonococcal prostatitis

Path	(a) Primary (b) Secondary to (a) Vesiculæ seminalis (β) Epididymis (γ) Kidney
Site	Near about ejaculatory ducts
Clinic	(1) Frequency of micturition in young adults (2) Acid pyuria (3) P R Enlarged tender, nodular prostate (4) Beaded vas deferens (5) Tender nodules in epididymis
Compl	Spread to (a) Genital tract (b) Urinary tract
Treat	(1) Conservative anti tuberculous (2) If tuberculous abscess Evacuation + curettage + B I P P (3) Excision If focus is primary and early
(4) CHRONIC PROSTATIC ABSCESS	
Etio	Tuberculosis of prostate
Clinic	(a) Signs of chronic tuberculous prostatitis ↓ (b) Fluctuation per rectum
Compl	Bursting (a) External sinus (b) Recto urethral fistula
Treat	Evacuation + curettage + B I P P
(5) PROSTATIC CALCULI	
Etio	Gonorrhœal prostatitis
Sites	(A) Exogenous prostatic urethra (B) Endogenous prostatic tissue (a) Associated with hypertrophy (b) Un associated with hypertrophy
Structure	Phosphate oxalate carbonate of calcium
Clinic	(a) Signs of stricture urethra or (b) Signs of enlarged prostate or (c) Signs of cystitis (d) P R hard, grating nodules (e) Sounding metallic click (f) \ Rays retro-symphysial opacities (g) Urethroscopy
Compl	(1) Acute retention of urine (2) Urethral stricture → back pressure (3) Cystitis (4) Enlarged prostate (5) Prostatic abscess

Treat: (A) Instrumental removal:

Ind: Prostatic urethral calculus

Tech: Urethrosopic removal

(B) Displacement + suprapubic removal:

Ind: Prostatic urethral calculus

(C) Perineal removal

(D) Prostatectomy.

Tech: (a) Suprapubic

(b) Perineal

Ind: Multiple stones in prostatic tissue

(II) PROSTATISM:

Def: Interference with emptying of the bladder due to:

(a) Prostatic enlargement

or (b) Prostatic fibrosis

Path: (A) **Hypertrophic prostatism: Hypertrophic prostate**

(a) *Simple hypertrophy:*

Syn. Chronic lobular prostatitis

Cause: Hormonic (testicular) hyperplasia

Path. Fibro epithelial degeneration

Site: Mid lobe hypertrophy

Morb. anat: Collar around internal meatus

(b) *Innocent growths:*

Syn: Fibro myo adenomata

Morb. anat: Symmetrical or asymmetrical enlargement;
Of a part of or whole of the prostate

(c) *Malignant growths:*

Syn: Carcinoma or sarcoma prostate

Morb. anat: (a) Irregular rapid enlargement

(b) Infiltration of surroundings

(d) *Chronic inflammatory hyperplasia:*

Syn: Chronic gonorrhoeal prostatitis

Cause: Gleet

Morb. anat: Chronic inflammatory hyperplasia

(B) **Atrophic prostatism: Fibrotic prostate**

Syn: Interstitial fibrotic prostatitis

Path: (a) Fibrous hyperplasia

+ (b) Glandular atrophy

Morb. anat: (a) Fibrous transverse bar:
: At the internal meatus

(b) Small, hard prostate

(c) Fibrosis of internal sphincter:
: Rigid,

(C) Extra-prostatic

Path: *Hyperplasia of posterior urethral glands*

Morb. anat: Small, soft, spherical projection:

: Near the internal meatus

Etio: (1) *Theories:*

(a) **Neoplastic:**

(α) Fibro myo adenoma

(β) Carcinoma

(b) **Hormonic:** Œstrogenic

(c) **Inflammatory:** Chronic inflammation

(d) **Degenerative:**

: Glandular atrophy + interstitial hypertrophy

(2) *Sites:*

(a) Middle lobe

(b) Lateral lobes

(c) Posterior lobe

(d) Anterior lobe

Clinic: (1) **Urinary obstruction type:**

In a man over 50

(a) Difficulty . at the start

(b) Frequency by night

(c) Dribbling . at the end of micturition

(d) Chronic retention:

(α) Partial residual urine

(β) Complete

(2) **Uræmic type:**

: Acute or chronic uræmia

(3) **Sexual type:**

. Senile sexual irritation

(4) **Complication type:**

(a) Acute retention of urine

(b) Hæmaturia

(c) Cystitis and ascending infection

(d) Urinary calculus

Signs (1) **P. R.:**

(a) Positive . (α) Hypertrophic

(β) New growth

(b) Negative (α) Middle lobe

(β) Fibrous prostate

(c) Prostatic massage

(2) **Catheterisation.**

(a) Obstruction

(b) Residual urine

(3) **Cystoscopy:**

(a) Prostate: (α) Shape of bladder neck

(β) Shape of the lobes

(b) Bladder: (1) Retro prostatic pouch

(2) Hypertrophy or dilatation

(3) Diverticulæ

- (5) Cystitis
- (6) Stone
- (7) Growths
- (c) Kidneys: renal efficiency
- (4) **Cystography:** (Injection of 15% Sodium Iodide in the bladder & X-Ray)

Compl: (1) **Abnormal micturition:**

- (a) Retention. (a) Acute
(β) Chronic
(γ) Recurrent
- (b) Incontinence: false
- (2) **Abnormal urine:**
- (a) Hæmaturia:
: Varicose peri prostatic veins
- (b) Pyuria:
: Cystitis, pyelitis

(3) **Urethral obstruction**

- (4) **Bladder:**
- (a) Hypertrophy → dilatation → overflow
- (b) Post-prostatic pouch: residual urine
- (c) Diverticulæ
- (d) Infection
- (e) Calculus. in post-prostatic pouch

(5) **Ureters and kidneys:**

- (a) Dilatation → inefficiency → uræmia
- (b) Ascending infection

(6) **Genital system:**

- : Sexual irritation

(7) **General system:**

- (a) Arteriosclerosis
- (b) Hypertension
- (c) Heart affections
- (d) Uræmia

(8) **Strain syndrome:**

- (a) Hernia. bilateral direct inguinal
- (b) Prolapse rectum
- (c) Hæmorrhoids

Treatment: (1) **Conservative:**

(A) **Hormonic:** Testosterone

(B) **Operative:**

- (a) **Steinach II:** Vasectomy
- (b) Voronoff: testicular graft
- (C) **Catheter life:** palliative
- (a) Intermittent urethral
- (b) Continuous suprapubic

(2) *Radical prostatectomy:*(A) **Suprapubic prostatectomy:**(a) *One stage:*

- Pre oper (a) Catheter drain
 (β) No catheter drain
 Tech: (α) Harris . prostatic bed reconstruct.
 (b) Thomson Walker . open
 (c) Freyer : closed
 Ind . (a) No urinary complications
 (b) Good general health

(b) *Two stage:*

- Tech (a) Suprapubic cystostomy
 ↓ (β) Prostatectomy :
 (1) Freyer : closed
 (2) Thomson Walker open
 (3) Harris . modified open
 : Retriggerisation
 (4) Ainsworth Davis :
 : Diathermic resection
 (5) Irwin :
 (a) Diathermic resection
 + (b) Division of int. sphincter

(c) *Three-stage:*

- Tech : (a) **Catheter drain + vasectomy :**
 : Gradual decompression
 ↓ (β) **Suprapubic cystostomy :**
 . Upto renal recovery
 ↓ (γ) **Prostatectomy :**
 Ind Chronic urinary retention

(B) **Perineal prostatectomy:** One or two stage

- (a) Young
 (b) Winsbury White

(C) **Trans-urethral prostatic resection:**

Syn . McCarthy

- Ind . (a) Prostatic fibrosis
 (b) Median lobe enlargement
 (c) Median bar obstruction

Indications for prostatectomy:(1) **Urinary irritation:** Frequency(2) **Urinary obstruction:**

- (a) Residual urine > 2 ounces
 (b) Recurrent acute retention
 (c) Difficult catheterisation
 (d) False incontinence
 (e) Back pressure signs

- (3) **Ascending urinary sepsis :**
 - (a) Cystitis
 - (b) Pyelitis, pyelonephritis
- (4) **Ascending genital sepsis :**
 - . Recurrent epididymo orchitis
- (5) Recurrent stone formation
- (6) Recurrent hæmaturia
- + (7) *No contra indications* (See below)

Contra indications for prostatectomy .

(A) *Temporary .*

- (1) Pronounced back pressure
- (2) Pronounced ascending sepsis
- (3) Mild circulatory complications
- (4) Mild pulmonary complications
- (5) Mild gastro-intestinal complications
- (6) Temporary deterioration of general health
- (7) Absence of preliminary investigations
- (8) Absence of pre operative preparation

(B) *Permanent .*

- (1) Inoperable carcinoma
- (2) General debility or cachexia
- (3) Incurable or dangerous disease :
Heart, blood pressure, liver
- (4) Failure of pre operative treatment

Indications for one stage operation .

- : **Early case** of enlarged prostate with **moderate residual urine** but **no complications** (especially infection) and with **nice reaction to preliminary treatment**

Indications for two stage operation :

- (a) **Back pressure :**
 - (α) Urinary renal failure
 - (β) Circulatory
 - (1) Uræmia
 - (2) Enlarged heart and hyperpiesia
- (b) **Ascending infection**
- (c) **Failure of non-operative preliminary treat.**
- (d) **Acute complications :** Acute retention

Advantages of two stage operation :

- (a) Less shock and hæmorrhage
- (b) Recovery from urinary & circulatory back pressure
- (c) Recovery from ascending sepsis

Disadvantages of two stage operation :

- (a) Two operations
- (b) More fibrosis
- (c) Post operative scar hernia

Preliminary investigations:

- (1) **Urinary examination :**
 - (a) Physical
 - (b) Chemical
 - (c) Microscopical
 - (d) Cultural
- (2) **Prostate examination :**
 - (a) P. R.
 - (b) Bimanual
 - (c) Cystoscopic
- (3) **Bladder examination :**
 - (a) Catheter : (α) Residual urine
(β) Bladder capacity
 - (b) Cystoscopy : condition of the bladder
- (4) **Kidney examination :**
 - (a) Ascending sepsis
 - (b) *Efficiency tests*
- (5) **Circulatory system :**
 - (a) Heart
 - (b) Arteries : arteriosclerosis
 - (c) Blood pressure
- (6) **Blood examination :**
 - (a) Coagulation time
 - (b) Bleeding time
 - (c) Hæmoglobin
 - (d) Urea content
- (7) **Pulmonary system :**

Chronic bronchitis, bronchiectasis
- (8) **Gastro-intestinal system :**
 - (a) Constipation
 - (b) Tympanitis
- (9) **Nervous system :**
 - (a) Stability
 - (b) Paralysis
- (10) **Metabolic examination :**
 - (a) Diabetes
 - (b) Uræmia
 - (c) Thyroid

Preliminary treatment of enlarged prostate:

- (1) **Urinary :**
 - (a) **Sepsis :**
 - (α) Urinary antiseptics and diuretics
 - (β) Urinary drainage :
 - (1) Urethral
 - (2) Suprapubic
 - (γ) Bladder lavage

- (b) *Obstruction* → *back pressure* :
 - (α) *Urinary drainage* :
 - (1) Urethral
 - (2) Suprapubic
 - (β) **Diuretics and hydrotherapy**
 - (2) *Blood* .
 - (a) **Coagulation treatment**
 - (b) Intravenous glucose, soda bi carb
 - (3) *Uræmia* .
 - (a) **Urinary drainage** :
 - (α) Urethral
 - (β) Suprapubic
 - (b) Intravenous sodium sulphate
 - (c) **Hydrotherapy and diuretics**
 - (4) *Circulatory*
 - (a) Hæmatinics
 - (b) **Course of digitalis**
 - (5) *Respiratory*
 - (a) Curative if complications are present
 - (b) **Prophylactic: antipneumonic**
 - (α) Deep breathing
 - (β) Anti catarrhal vaccine
 - (γ) Camphor in oil
 - (6) *Gastro intestinal* .
 - (a) **Antiseptics**: Carbon, salol
 - (b) Bowel washes
 - (c) **Laxatives**
 - (7) *Metabolic*
 - Ductless glandular therapy .
 - (a) Testosterone
 - (b) Thyroid extract
 - (8) *Nervous system* .
 - (a) Sedatives
 - (b) Nervine tonics
 - (9) *General sepsis*
 - Sulphonamides
 - (10) *Preliminary operative procedures* .
 - (a) **Urinary drainage** :
 - (α) Suprapubic indwelling catheter
 - (β) Suprapubic cystostomy
 - (b) **Vasectomy** :
 - (α) Steinach I
 - (β) Steinach II
 - (c) **Testicular graft**: Voronoff
- Preliminary urinary drainage methods :*

- (a) Indwelling urethral catheter
- (b) **Suprapubic :**
 - (a) Puncture with indwelling de Pezzer
 - Ind. Acute back pressure
 - (β) **Cystostomy :**
 - Ind. (1) Moderate back pressure
 - + (2) Urinary sepsis

- (c) **Urethral + suprapubic :**
- Ind. (a) Pronounced cystitis
- (β) Vesical hæmorrhage

- Anæsthesia
- (1) Chloroform ether
 - (2) Spinal
 - (3) Intravenous evipan
 - (4) Local

- Treat
- (1) One stage prostatectomy
 - (2) **Multi-staged prostatectomy :**
 - (A) **Catheter drain + vasoligature :**
 - (a) Gradual catheter decompression
 - For 10 days
 - (b) Bladder lavages B D
 - Pot permang 1 in 8000
 - (c) Bladder instillations
 - 4 ounces of silver nitrate 1 in 4000
 - (d) Urinary antiseptics & diuretics

- ↓ (B) **Suprapubic cystostomy :**
 - (a) Renal function tests
 - (α) 12th day
 - ↓ (β) Weekly intervals
 - (b) Condition of urinary sepsis

- ↓ (C) **Prostatectomy :**
- Ind (a) **Normal renal functions :**
 - (α) Blood urea not more than 50
 - (β) Urea concentration $2\frac{1}{2}\%$
- (b) **Urinary sepsis under control**

- Steps
- (1) Pre operative technique
 - (a) 20 c.c.s. coagulen ciba
 - (b) Removal of suprapubic tube
 - (c) Preparation of operative field
 - (d) Plugging of bladder cavity
 - Through suprapubic opening
 - (2) Excision of suprapubic scar and tract
 - (3) Midline widening of suprapubic incision
 - (4) Prostate pushed up by rectal finger
 - (5) Blunt dissection & removal of prostate
 - . Between false and true capsule
 - (6) Midline splitting of post commissure
 - : Between bladder and prostatic cavity

- (7) Suture around suprapubic tube of
 - (a) Anterior bladder wall
 - (b) Anterior rectus sheath
 - (c) Skin
- After treat (a) Skin protection
 - Equal parts of zinc & castor oil
- (b) Suprapubic drainage
 - (α) Box
 - (β) Bottle

Different techniques of prostatectomy

(A) *Suprapubic prostatectomy*

(1) *Freyer*

Syn **Closed prostatectomy**

- Tech (a) Small incision
(b) Blind enucleation

- Disadv (a) Fat or rigid abdominal wall
(b) Unchecked hæmorrhage
(c) Frequent sepsis
(d) Post operative valve obstruction

(2) *Thomson Walker*

Syn **Open prostatectomy**

- Tech (a) Bladder lavage and distension
(b) Suprapubic midline cystotomy

- Incision (α) Vertical midline
(β) Transverse

- (1) 1" above symphysis
For one stage
- (2) 2" above symphysis
For two stage
- (c) Inspection of bladder cavity
- (d) Digital enucleation of prostate
Bimanual intra urethral
Break through the muc mem imme
diately lateral to the verumontanum
- (e) Introduction of automatic retractor
- (f) Inspection of prostatic bed
- (g) Treatment of
 - (α) Hæmorrhage
 - (1) Catch and tie
 - (2) Iodoform plug
 - (β) Tags excise
- (h) Stitching postero lateral vesico pros
tatic margins
- (i) Drainage tube in
 - (α) Bladder
 - (β) Retzius
 - (γ) Urethra (catheter)
- (j) Closure of the wound

(3) Harris :Syn : (a) **Open prostatectomy**+ (b) **Urethral reconstruction**Tech : (a) **Thomson-Walker open prostatectomy**(b) **Re trigonisation .**

• Approximation of the trigonal apex to the upper end of torn prostatic urethra

: Suture from behind the ureteric bar to the floor of the prostatic cavity with a special needle

(c) **Insertion of rubber catheter No. 12 :**

• Transversely cut tip

: Lateral eye 15" from the tip

(d) **Obliteration of prostatic cavity**(e) **Reformation of urethral side walls :**

: Sutures transversely from side to side of prostatic bed, lying above and in front of indwelling catheter

(f) **Three looped suture :**(a) **Valvular closure of the bladder**(β) **Obliteration of Retzius**(γ) **Closure of lower angle of incision**(g) **Closure of abdominal wall**Adv. : (a) **Control of hæmorrhage**(b) **Covering of all raw surfaces**(c) **Obliteration of prostatic bed**(d) **Reformation of prostatic urethra**(e) **No stricture or tags*****After-treatment of suprapubic prostatectomy :*****(1) Continuation of general preliminary treat. :**(a) **Hydrotherapy + glucotherapy**(b) **Diuretics**(c) **Urinary antiseptics****(2) Local treatment :**(a) **Catheter drain : for 10 days**

: Closed sterile bottle drainage

(b) **Bladder lavage : B. D.**

: Silver nitrate 1 in 3000 + soda citras 4%

(c) **Removal of drainage tubes :**(a) **Retzius . 3rd day**(β) **Bladder : 6th day**(γ) **Catheter : 10th day**(d) **Measurement of urine per 24 hours****(3) Treatment of complications*****Complications of suprapubic prostatectomy :*****(1) Shock :**

Treat Anti shock treatment, transfusion

(2) **Hæmorrhage :**

Path (a) Primary wrong plane of cleavage

(b) Reactionary

(c) Secondary

Treat (a) General (α) Morphia

(β) Coagulants

(γ) Intramuscular whole blood

(δ) Blood transfusion

+ (b) Local

(α) Irrigations Silver nitrate 1 in 8000

Hot saline 110° F

(β) Instillations Tr ferri perchlor

Adrenaline

(γ) Packs Iodoform gauze for 72 hours

↓ (c) Operative

Tech (1) Re open under spinal

(2) Bladder irrigations at 110° F

(3) Inspection of prostatic bed

(4) Removal of clots

(5) Pack with

(α) Hydrogen peroxide gauze

or (β) Pilcher bag

(6) Bladder wash

(7) Closure with

(α) Cystostomy tube

(β) Retzius tube

After treat (a) Continuous drip saline + coramine

or (b) Continuous drip blood transfusion

(c) Leave in Pilcher bag for 72 hours

With 3 ounces weight extension

(3) **Pain :**

Treat (a) Morphia, hyoscine

(b) Sedative enema

Aspirin 15 grains

+ Ammon brom. 30 grains

+ Water 2 ounces

(4) **Uræmia :**

Path (a) Acute immediate anuria

(b) Chronic at the end of 3-4 weeks

Treat (a) Hydrotherapy via all routes

(b) Diuretics

(α) Intravenous drip sod sulphate

(β) Thorium sod acetate

(5) **Ascending sepsis :**

Factors (a) Pre-operative sepsis

(b) Retained catheter

(c) Stagnation in prostatic bed

- (d) Detached tags
- (e) Blood clots
- Treat. (a) Urinary antiseptics
- (b) Diuretics and hydrotherapy
- (c) Urinary drainage
- (d) Bladder irrigations

(6) Pulmonary complications :

- Path (a) Bronchitis
- (b) Pneumonia
- (c) Collapse
- (d) Œdema
- (e) Infarction
- (f) Embolism
- Treat (a) Deep inhalations
- (b) Turpentine stupes
- (c) Camphor in oil
- (d) Early mobilisation of patient

(7) Gastro intestinal complications :

- Path (a) Primary
- (b) Secondary to uræmia
- Treat (a) Intestinal antiseptics
- (b) Laxatives
- (c) Acetyl-choline
- (d) Rectal tube—enemata stupes

(8) Epididymitis :

- Path Ascending infection via vas deferens
- Treat (a) Rest + support + counter-irritants
- (b) Urethral rest
- (c) Preventive bilateral vasectomy

(9) Heart failure

(10) Thrombosis and embolism :

- Eti (a) Arteriosclerosis
- (b) Hyperpiesia
- (c) Circulatory debility
- (d) Stasis
- Path (1) Pulmonary
 - (a) Instantaneous death
 - (b) Acute pulmo-cardiac crisis
 - (c) Infarction pneumonia
- (2) Cerebral apoplexy

(11) Delirium :

- Types (a) Nervosum
- (b) Tremens
- Treat (a) Laxatives
- (b) Sedatives
- (c) Allowance of wine

(12) Wound infection :

- Path (a) Urine irritation

- (b) Suppuration
- (c) Sloughing
- (d) Gangrene

Treat Skin protect on zinc and oil

(13) Pelvic cellulitis •

Etio Tearing of fibrous sheath

Treat (a) Retzius drain

(b) Sulphonamides

(14) Acidosis •

Treat Glucose soda bi-carb

Sequelæ of suprapubic prostatectomy

(1) Unhealing suprapubic fistula :

Etio (a) Fibrosis

(b) Adhesion to bone

(c) Sepsis

(d) Urethral obstruction Tags stricture

(e) Calculus

Treat (a) Treat the cause

(b) Tie in an urethral catheter for 10 days

(2) Recurrent urinary obstruction :

Etio (a) Tag flap

(b) Stricture

(c) Recurrence of prostatism

Treat Treat the etiology

(a) Intra urethral removal of tags

(b) Kollmann's dilator

(c) Tying in a catheter

(3) Sterility In all cases

(4) Calculus

Treat (a) Keep the urine acid

(b) Removal through suprapubic fistula

(B) Perineal prostatectomy

(1) Young's technique

With special retractor

(2) Winsbury-White Two stage

Tech (a) Exaggerated lithotomy position

(b) Passage of prostatic tractor

Per urethrum

(c) Direct the perineum towards ceiling

(d) Perineal horse-shoe incision

3 cms in front of anal margin

↓ Midway between (α) anus
& (β) ischial tuber
on either side

(e) Division of central perineal point

(f) Cleavage between

(α) Transversus perinealis

& (β) Rectum

- (g) Put in a rectal guide
- (h) Transverse division of recto-urethralis
- (i) Division of Denonvilliers fascia
- (j) Exposure of prostatic capsule
- (k) Perineal retractors
- (l) T incision in prostatic capsule
- (m) Enucleation of prostate
- Sequelæ (1) Incontinence (of urine)
Due to trauma to sphincter

- (2) Stricture urethra
- (3) Rectal trauma
- (4) Epididymitis
- (5) Urinary fistula
- (6) Hæmorrhage

(C) *Urethral prostatectomy*

- Ind (a) Transverse urethral bar
- (b) Prostatic fibrosis
- (c) Post-operative tag flap
- (d) Middle lobe collar
- Pre-oper Cystostomy or urethral drain
- Tech Trans urethral punch
- Post-oper Urinary drain
- Compl (1) Hæmorrhage
 - (a) Primary
 - (b) Secondary
- (2) Recurrence

(D) *Diathermic removal* suprapubic

- (1) *Ainsworth Davis*
- (2) *Ireen*
 - (a) Posterior mobilisation
 - (b) Division of internal sphincter

Palliative treatment of enlarged prostate

- (1) **Catheter life.**
 - (a) Intermittent auto catheterisation
 - (b) Continuous self retaining
- (2) **Hormonic treatment:**
 - (a) Testosterone
 - (b) Steinach I or II
 - (c) Voronoff testicular graft
- (3) **Treatment of complications** As they arise

Main causes of death after prostatectomy.

- (1) **Uræmia:**
 - (a) Acute within first week
 - (b) Chronic within four weeks
 - (2) **Shock:** Within first 24 hours
 - (3) **Hæmorrhage:**
 - (a) Primary
 - (b) Reactionary
- } . within first 72 hours

- (c) Secondary : end of first week
- (4) **Cardiac failure** : Sudden death at any time
- (5) **Pulmonary embolism** : Sudden death at any time
- (6) **Ascending infection** :
 - (a) Starts on 4th or 5th day
 - (b) Death in about two weeks
- (7) **Pulmonary complications** :
 - (a) **Edema** }
 - (b) **Collapse** } : Starts within first 48 hours
 - (c) **Pneumonia** . starts on 3rd or 4th day
- (8) **Mania** :
 - : Starts within first week
- (9) **Pelvic cellulitis** :
 - : Starts within first three days
- (10) **General debility and decubitus**

(III) NEW GROWTHS :

(A) *Benign* :

- (1) **Adenoma** }
- (2) **Fibro-myoma** } : Prostatism

(B) *Malignant* :

(1) **Sarcoma** :

Etio: Age 3 to 10
: 20 to 40

Clinic Smooth large growth
: With rapid urinary obstruction

(2) **CARCINOMA PROSTATE** :

Etio: (a) Age . 50-70
(b) Chronic prostatitis
(c) Enlarged prostate

Path: Spheroidal or columnar celled

Types. (a) **Histological** :

: Laboratory diagnosis in removed prostate

(b) **Scirrhus** :

: Small, hard, irregular prostate

(c) **Encephaloid** :

: Prostate pelvic
: Rapid, soft enlargement
: Sciatica

(d) **Metastatic** :

(a) Spontaneous fracture
(b) Bony tumour or sclerosis

Clinic: (1) **Latent** :

(a) No symptoms: found post mortem
(b) Very late symptoms

- (r) Found during prostatectomy
For simple enlargement
- (2) **Prostatism syndrome**
- (a) Urinary obstruction
Rapid and steady progress
 - (β) Urethral hæmorrhage
 - (1) Pain
 - (1) Local
 - (2) Referred scrotal
Obturator neuralgia
- (3) Cachexia
- Signs (1) **P R**
- (a) Character hard soft irregular
 - (b) Mobility and adhesions
 - (c) Condition of seminal vesicles
- (2) **Catheterisation**
- (a) Difficult
 - (b) Hæmorrhage out of proportion
- (3) **Cystoscopic examination**
- (4) **Microscopical examination**
- (5) **Secondaries**
- (a) Pelvic glands
 - (b) Bones
 - (a) Fracture
 - (β) **Sclerosis or tumour**
 - In (1) Vertebra
 - (2) Femur
 - (3) Pelvis
 - (4) Rib
 - (5) Clavicle
- Compl (1) **Urinary obstruction**
- (2) **Urinary ascending infection**
- (3) Urinary hæmorrhage
- (4) Rectal obstruction
- (5) Recto urinary fistula
- (6) Secondaries
- (7) Cachexia
- Treat (A) **Radical**
- Perineal and suprapubic removal of
- (a) Prostate
 - (b) Seminal vesicles
 - (c) Vas deferens
 - (d) Trigone of the bladder
- (B) **Palliative**
- (a) Medicinal morphin cobra venom
 - (b) Instrumental
 - (a) Catheterisation
 - (β) Per urethral resection

- (c) Surgical
 - Permanent suprapubic cystostomy
- (d) Radiological
 - (a) Deep X Rays
 - (β) Radium

(IV) PROSTATIC NEUROSES:

- Clinic (a) Difficulty in micturition
 Due to (a) Hyperæsthetic & painful prostate
 (β) Hyperæsthetic prostatic urethra
 (r) Spasm of prostatic muscles
 (b) Neurasthenia
- Causes (1) Acute prostatitis
 (2) Chronic prostatitis
 (3) Sexual excess
- Treat (a) Nervine tonics
 (b) Treatment of prostatitis

(V) IMPORTANT POINTS

- (1) *Prostatitis is most commonly secondary to posterior urethritis, very frequently gonorrhœal, and is due either to natural extension or ill advised instrumentation during acute phase of urethritis*
- (2) Radical measures and all kinds of instrumentation of the urethra are contra indicated in T B prostate
- (3) Mortality of apparently hopeless cases of prostatic obstruction can be kept to a low figure by careful and prolonged urinary drainage
- (4) *Prostatectomy has been made safer by the simple expedient of not being in a hurry after instituting bladder drainage*
- (5) *Bilateral vasectomy is a most important procedure in the prevention of needless and sometimes fatal orchitis in old and enfeebled patients*
- (6) *Initial tuberculous lesion picks out either seminal vesicle or epididymis*
- (7) Prostatic fibrosis leading to bladder neck obstruction constitutes about one third of the total number of cases of prostatism
- (8) *In chronic interstitial prostatitis or median bar obstruction, enucleation of the prostate is dangerous, as no line of cleavage is there, and may result in injury to the bladder, urethra or rectum, so it should be treated by excision of the bar and re trigonisation*
- (9) *Residual urine is an important sign in prostatic obstruction and an indication for prostatectomy.*

- (10) Bleeding is less common in malignant than in benign prostate.
(Med. Ann 1937)
- (11) *A hard area within the prostate*
 - (a) *Malignancy*
X Ray pelvic bones
 - (b) *Calculus*
X Ray the prostate
 - (c) *Distended acini*
- (12) Together with the vertebræ, the pelvic bones are the commonest sites for secondary deposits in malignant prostate
- (13) *Induration of the vesicles raises the suspicion of carcinoma prostate*
- (14) *The whole of the prostatic surgery depends on renal function*
- (15) *Sudden relief of hypertension, by passing a catheter and emptying a chronically distended bladder at one stage, or by open suprapubic cystostomy, in acute urinary obstruction is extremely badly tolerated, always leading to*
 - (a) Depression of renal function
Anuria \rightarrow Uræmia
 - (b) Hæmaturia
- (16) Permanent contra indications for prostatectomy
 - (a) General incurable diseases or senility
 - (b) Regional incurable urinary sepsis or back pressure
 - (c) Local inoperable malignancy
- (17) Every undoubted case of prostatic obstruction should be operated upon as early as possible provided there are no permanent contra indications.
- (18) External urinary drainage routes
 - (a) Urethral indwelling catheter
 - (b) Perineal
 - (c) Suprapubic
 - (a) Indwelling catheter
 - (b) Open cystostomy
 - (d) Nephrostomy
- (19) *Catheter drainage is essential as a preliminary to suprapubic cystostomy or one stage prostatectomy in the presence of*
 - (a) *Infection*
 - (b) *Residual urine > 4 ounces*
 - (c) *Renal inadequacy*
- (20) *No prostatectomy is undertaken—whatever the other tests of renal function may indicate—unless a good blue colour appears in the urine within 10 minutes of intravenous injection of 10 c.cs of 4% indigocarmine*

- (21) Prostatectomy errors
 - (a) Freyer's blind operation
 - ↓ (b) Thomson Walker's open operation
With suture of bleeding points
 - ↓ (c) Harris open operation
Reconstitution of prostatic urethra
- (22) *Bimanual intra urethral enucleation of the prostate is the best method, as it gives the right plane and preserves the floor of prostatic urethra*
- (23) *All bleeding from prostatic rim and bed must be definitely checked before closure just as bleeding from a tonsil bed*
- (24) Sutures in prostatic rim
 - (a) When bleeding is arterial
In front of bleeding point
 - (b) When bleeding is venous
Behind the bleeding point
- (25) *Never send a patient away till all bleeding from a tonsillar fossa is reliably controlled never close a bladder completely till all bleeding from it is reliably controlled*
- (26) Pulmonary embolism is relatively frequent after prostatectomy treat it by prophylactic massage + movements + avoidance of pillows under the knees + avoidance of unnecessary intravenous medication
- (27) *Micturition is normally established about the 14th to 18th day after prostatectomy and the wound firmly healed in 3 or 4 weeks*
- (28) *Persistent rise in temperature after prostatectomy*
 - (a) Ascending urinary sepsis
 - (b) Extravesical cellulitis
 - (c) Epididymo-orchitis
 - (d) Chest condition
- (29) *An examination of cardiovascular system is of signal importance before any operation upon the prostate gland*
- (30) A break down of the circulatory system is the most frequent cause of death after prostatectomy
- (31) Prostate carcinoma rectal examination
 - (a) Indurated enlargement of prostate
 - + (b) Distension and infiltration of seminal vesicles.
- (32) *Radical treatment is usually out of question when a definite clinical diagnosis of carcinoma prostate can be made.*
- (33) *If medical attendants get into the habit of making a rectal examination during all physical examinations on men past 40 years of age many early cases of carcinoma prostate would be discovered*

- (34) Main etiological factors in acute prostatitis
 (a) Acute gonorrhœal urethritis
 (b) Urethral instrumentation
- (35) Main sign of chronic prostatitis
 Threads and commas in urine passed after prostatic massage
- (36) *Prostatism urinary obstruction due to abnormal prostate*
 (a) *Middle lobe hypertrophy*
 (b) *Generalised hypertrophy*
 (c) *Scirrhus prostate*
 (d) *Median bar*
 (e) *Post operative flap obstruction*
- (37) Indication for prostatectomy
 Every case of urinary obstruction due to prostatism, with no permanent contra indications
- (38) *Never fail to investigate before operation*
 (a) *Kidney efficiency*
 (b) *Circulatory and blood examination*
 (c) *Local examination*
- (39) Temporary contra indications for prostatectomy
 (a) Treatable urinary back pressure
 (b) Treatable urinary sepsis
 (c) Treatable circulatory or pulmonary complication
- (40) *Never remove a prostate before fully preparing the patient for the ordeal, treat likely complications*
 (a) *Urinary back pressure syndrome*
 (b) *Urinary sepsis*
 (c) *Pulmonary antiscarrhal vaccines*
 (d) *Gastro intestinal antiseptics*
 (e) *Circulatory digitalis, thyroid*
 (f) *Blood coagulants, transfusions*
 (g) *Acidosis glucose soda bi carb*
 (h) *General sepsis sulphonamides*
- (41) Places common for adeno fibro myoma
 (a) Breast
 (b) Uterus
 (c) Prostate
 (d) Parotid
- (42) *Etiology of senile prostatic hypertrophy*
 (a) *Neoplastic*
 (b) *Hormonic*
 (c) *Inflammatory*
- (43) *Prostatectomy is imperative in*
 (a)
 (b)
 (c)
Cystitis, calculus

- (d) *Back pressure effects*
- (e) *Residual urine with frequency*
- + (f) *General good health*
- + (g) *Efficient kidneys*
- (44) *Common sequelæ after prostatectomy*
 - (a) *Unhealing suprapubic fistula*
 - (b) *Difficult urination*
 - (1) *Flap obstruction*
 - (2) *Stricture urethra*
 - (3) *Recurrence*
 - (4) *Malignant prostate*
 - (c) *Incontinence*
 - (d) *Sterility*
 - (e) *Mental instability*
- (45) *Common causes of death after prostatectomy*
 - (A) *Within first week*
 - (a) *Shock*
 - (b) *Hæmorrhage primary, reactionary*
 - (c) *Anuria*
 - (d) *Acidosis*
 - (e) *Heart failure*
 - (B) *Within second week*
 - (a) *Ascending infection*
 - (b) *Hæmorrhage secondary*
 - (c) *Heart failure*
 - (d) *Chest complications*
 - (C) *At the end of third or fourth week*
 - (a) *Chronic uræmia*
 - (b) *Decubitus*
 - (c) *Pulmonary embolism*
 - (d) *Heart failure*
 - (D) *Any time.*
 - (a) *Heart failure*
 - (b) *Pulmonary embolism*
- (46) *Death due to uræmia*
 - (a) *Acute within 3 to 7 days*
 - (b) *Chronic at the end of 3 to 4 weeks*
- (47) *Do not fail to examine all the bones in cases of suspected carcinoma prostate, conversely, examine prostate in every case of bone sclerosis in senile males.*
- (48) *In cases of senile sciatica, rectal examination is imperative*
- (49) *Gum elastic catheters are best in prostatism*
- (50) *Primary T B in genito urinary system*
 - (a) *Kidneys*
 - (b) *Seminal vesicles*
 - (c) *Epididymis*

- (51) *Be sure to get into the right layer of cleavage at the time of prostatic enucleation; if real fibrous capsule is interfered with, following will result:*
- (a) Hæmorrhage
 - (b) Excision of vesicles
 - (c) Pelvic cellulitis
 - (d) Damage to the bladder or rectum
- (52) *Diagnosis of right layer of cleavage.*
- (a) Easy enucleation
 - (b) Little hæmorrhage
- (53) *Enlarged prostate has two capsules.*
- (a) *Real fibrous capsule*
: *Containing peri prostatic venous plexus*
 - (b) *Pseudo capsule*
Of compressed prostatic normal tissue, the line of cleavage is inside the false capsule, i.e. between it and the adenoma
- (54) *A large abscess of the prostate should be drained surgically regardless of whether or not it has burst spontaneously.*
- (55) *There are countless patients being treated for myositis lumbago and sacro iliac strain, by prolonged courses of physiotherapy, diathermy, hydrotherapy, chiropractic measures, sacro-iliac belts and even a Taylor's brace, when all the time vesiculitis and prostatitis are the seats of trouble.*
- (56) *In low backache of unknown origin, an infected prostate as the cause cannot be ruled out until seminal vesicular and prostatic secretions have been proved to be negative on three successive occasions*
- (57) *Dogs are the only sufferers from prostatic enlargement in the animal kingdom*
- (58) *Prostatic enlargement is very rare in China.*
- (59) *It is a safe rule never to operate on any patient with an enlarged prostate within at least ten days of the commencement of the preparation by catheter drainage*
- (60) *Pressure on the external meatus of the indwelling catheter, is the most potent cause of meatal stricture*
- (61) *If there is intolerance to indwelling catheter or if infection is present, a preliminary cystostomy should be done under local anæsthesia before prostatectomy unless acute retention is present, in which case a suprapubic indwelling catheter with gradual decompression should precede the open cystostomy.*
- (62) *Lymphatic œdema of the scrotum sometimes occurs in malignant prostate (Personal case)*

CHAPTER VII

SEMINAL VESICLES AND SPERMATIC CORD

(A) THE SEMINAL VESICLES

(I) TRAUMA:

Etio: Operative trauma in prostatectomy

- Compl: (1) Shock
(2) Hæmorrhage
(3) Pelvic cellulitis

(II) INFLAMMATION:

(1) ACUTE VESICULITIS.

Etio: (a) Posterior urethritis

- (a) Gonorrhœal
(β) Instrumental

- (b) Prostatitis
(c) Cystitis B coli

- Bact: (a) Gonococci
(b) Staphylococci
(c) Streptococci
(d) Diphtheria bacilli
(e) Colon bacilli

- Clinic: (1) Signs of prostatitis
(2) Pain

- (a) Local
(b) Testicular

- (3) Sexual abnormalities:
(a) Premature emissions
(b) Painful emissions
(c) Blood-stained emissions
(d) Painful erections

- (4) P. R.
: Tender sausage like swelling

Treat: (A) Acute stage:

- (1) Stoppage of urethral instrumentation
(2) Pot. citras. + Tr hyoscyamus
(3) Morphia + Ichthyol suppositories

(B) Sub acute stage:

- (a) Bladder distension
↓ (b) Vesicular massage
↓ (c) Micturition

(2) CHRONIC VESICULITIS

Etiology (A) Tuberculous vesiculitis

- Path (a) Primary
 (b) Secondary to epididymitis, prostate
- Clinic (a) P R Large nodular, indurated
 (b) T B elsewhere prostate testis
- Treat (a) Conservative anti-tuberculous
 (b) Prophylactic vasectomy
 In primary cases
 (c) Inguinal route excision

(B) Gonococcal vesiculitis

- Cause Chronic gonococcal urethritis
- Clinic (a) Gleet
 (b) Sexual irritation
 (c) Bladder neck irritation
 (d) Chronic backache
 (e) P R Enlarged vesicles
 (f) Vesicular massage
 In upright position

(C) Septic vesiculitis

- Cause B coli or instrumentation urethritis
- Clinic (As above)

- Compl (a) Epididymo orchitis
 (b) Peri ureteritis stricture ureter
 (c) Ascending infection
 (d) Renal colic
 Due to ureteral spasm
 (e) Relapsing iritis
 (f) Rheumatism
 (g) Hæmospermia

- Treat (1) Digital evacuation
 (a) Distension of bladder
 ↓ (b) Digital vesicular massage
 In upright position
 ↓ (c) Evacuation of bladder
- ↓ { (2) Vasotomy
 (3) Vesicular lavage B D for 7 days
 (a) 0.5% argyrol
 (b) 1 in 1000 mercurochrome
- (4) Excision trans vesical
- Tech (a) Suprapubic cystotomy
 (b) Trendelenburg posture
 (c) Incision of bladder base
 (d) Excision of vesicles
 (e) Drainage
 (α) Vesicular tube
 (β) Vesical tube
 (γ) Retzius tube

(3) VESICULAR CALCULI.

Etiology: Chronic vesiculitis

: Age past 40

Path: Small and multiple

Clinic: (a) P. R.

(b) X Rays

(III) CYSTS AND TUMOURS:

(1) Vesicular cyst.

Path: Single, unilateral, unilocular

: Contains bloody fluid

Treat: Suprapubic extraperitoneal marsupialisation

(2) Carcinoma of the vesicle.

Clinic: (a) Hæmaturia and hæmospermia

(b) Deep pelvic pain

(c) P. R.: hard nodular mass

(IV) VESICULAR MANIPULATIONS:

(1) Vesicular massage:

(a) Urethral irrigation

(b) Bladder distension

(c) Digital massage.

: In upright position

(d) Evacuation of bladder

(2) X-Rays:

Ind: (a) Concretions

(b) Calcification

(c) Vesiculography.

Routes: (a) Urethroscope

(b) Vasotomy

Medium: Thorotrast 2 c cs

Position: Prone

(3) Excision:

(a) Perineal

(b) Inguinal extraperitoneal

: In tuberculosis

(c) Trans vesical (See above)

(B) COWPER'S GLANDS**COWPERITIS:**

Etiology: Posterior urethritis

Clinic: Bimanual (recto perineal) palpation:

: Tender swelling to one or other side of median raphe

Diff diag: (1) Acute prostatitis

(2) Vesiculitis

(3) Peri-urethral abscess

(4) Urethral fistula

(5) Ischio-rectal abscess

(6) Fistula in ano

- Treat : (a) Rest in bed
 (b) Sitz or hip bath
 (c) Sulphonamides
 (d) Drainage of the abscess
 (e) Excision in chronic phase

(C) SPERMATIC CORD

(I) CONGENITAL AFFECTIONS:

(1) SHORT CORD.

- * Associated with imperfect descent of testis

(2) MISPLACED CORD

- * Associated with ectopic testis

(3) PATENT PROCESSUS VAGINALIS:

(A) *Congenital hydrocele*

Def. Collection of fluid in an entirely unobliterated processus vaginalis

Clinic (a) Inguino-scrotal swelling:

- (1) Translucent
- (2) Pyriform
- (3) Dull
- (4) Reducible
- (5) Impulse present

(b) Testis enveloped

Compl. Hernia

Association: Ascites

Treat Excision of the patent process

(B) *Funicular hydrocele*:

Def: Collection of fluid in the patent funicular process, shut off from the tunica vaginalis, at the apex of the testis

Clinic: (a) Inguino-scrotal swelling:

- (1) Translucent
- (2) Pyriform
- (3) Dull
- (4) Reducible
- (5) Impulse present

(b) Testis: separate at lower end

Compl: Hernia

Treat: Excision of the patent process

(C) *Infantile hydrocele*:

Def: Collection of fluid in the patent processus vaginalis, closed at the internal abd. ring

Clinic: (a) Inguino-scrotal swelling:

- (1) Translucent
- (2) Pyriform
- (3) Dull

- (4) Irreducible
- (5) Impulse absent

Treat: (1) Testis enveloped
(2) Tapping
(3) Tapping + injection
(4) Radical operation:
: Excision

(D) *Hour glass hydrocele* :

Def: Infantile hydrocele, with constriction at external abdominal ring

(E) *Bilocular hydrocele*

Def: Infantile hydrocele with fluid in two pouches, communicating with each other

Path. (a) Scrotal pouch
+ (b) Parietal pouch
(a) Subcutaneous
(β) Inter parietal
(γ) Pro-peritoneal
(δ) Retro peritoneal

Clinic: **Inguino-scrotal swelling** :

- (a) Translucent
- (b) Cystic

(c) **Partially reducible** :

: From one pouch to the other

Treat: (1) Tap
(2) Tap + injection
(3) Radical: excision

Post compl: **Overlooking the parietal pouch**

(F) *Encysted hydrocele*.

Def: Collection of fluid in the patent middle portion of processus vaginalis which is closed at :

- (a) Internal abdominal ring
- & (b) Apex of the testis

Clinic: (1) **Inguino-scrotal or inguinal swelling** :

- (a) Int. abd. ring to apex of testis
- (b) Translucent
- (c) Dull
- (d) Cystic
- (e) Ovoid or round
- (f) **Non-reducible**
- (g) Impulse absent
- (h) Moving with the testis

(2) **Testis** : separate at lower end

Diff. diag: (1) Cyst of the epididymis
(2) Irreducible inguinal hernia
(3) Growth of the cord

- Treat: (a) Tapping
 (b) Tapping + injection
 (c) Radical: excision
- (G) *Congenital indirect hernia*:
 (a) Of the vaginal process
 (b) Of the funicular process
- (H) *Infantile indirect hernia*
 (a) Intrafunicular
 (b) Retrofunicular
- } (See under Hernia)

(II) TRAUMA:

(1) ACCIDENTAL TRAUMA.

(A) **Contusion**: Due to a blow

(B) **Diffuse hæmatocele of the cord**:

- Path Rupture of one of the veins of Pampiniform plexus
 Clinic (a) Muscular exertion
 (b) Diffuse hæmatoma
 (c) Ecchymosis scrotum
 (d) Painful swelling

- Treat (a) Conservative
 (a) Application of cold
 (β) Elevation and support
 (b) Incision → removal of the clot

(C) **Local hæmatocele of the cord**:
 : Bleeding in encysted hydrocele

(2) OPERATIVE TRAUMA.

(A) **Hæmatocele of the cord**: Pampiniform trauma

- (a) Local
 (b) Diffuse

(B) **Trauma to vas deferens**:

- Treat: (a) Anastomosis over a needle
 (b) Vaso ligation

(C) **Trauma to artery**

(3) TORSION OF THE CORD.

. In association with torsion testis (See under Testis)

(III) INFLAMMATION: *Funiculitis*

(1) TRAUMATIC FUNICULITIS:

- (A) Contusion
 (B) Haematoma
 (C) Torsion

(2) INFECTIVE FUNICULITIS:

(A) *Acute funiculitis*:

(1) **Acute endemic funiculitis**:

Path: Streptococcal thrombo phlebitis
 ↓ Streptococcal cellulitis

- Clinic (a) Acutely inflamed cord
(b) General septic toxæmia
- Diff diag (1) **Strangulated hernia**
(2) Inguinal acute lymphaderitis
- Compl (a) **Suppuration**
(b) **Septicæmia**
(c) Acute inflamed hydrocele
- Treat (a) Sulphonamides + antiserum
(b) Free incisions and drainage
- (2) **Ascending urethral funiculitis**
- Etio Posterior urethritis
(a) Gonococcal
(b) B coli
(c) Instrumentational
(d) Post operative
- Associated Epididymo orchitis
- Routes (a) Vas lumen
(b) Lymphatics
- Treat (a) Stop all urethral treatment
(b) Rest + support + counter irritant
(c) Sulphonamides

(3) **Filarial funiculitis**

- Etio Filariasis
- Path Streptococcal lymphangitis → cellulitis
- Clinic (a) Recurrent acute funiculitis
(b) Associated filarial syndrome
Elephantiasis scrotum & penis
- Treat (a) Sulphonamides + antiserum
(b) Sulfarsenol injections

(B) *Chronic funiculitis*

(1) **Tuberculous funiculitis**

- Etio (a) T B Testis
(b) T B Prostate
(c) T B Vesicles
- Path (a) **Ascending**
From prostate or vesicles
(b) **Descending**
From testis
- Clinic (1) **Beaded vas**
(2) Associated T B prostate, vesicle or testis
- (2) **Gonococcal funiculitis**
Associated with chronic epididymo orchitis
- (3) **Filarial funiculitis**
Elephantiasis of cord and scrotum
- (4) **Guinea worm**

(3) PROCESSUS VAGINALITIS

- Syn **Hydrocele of hernial sac**
 Cause **Obstructed or strangulated hernia**
 Clinic **Inguino scrotal swelling**·
 (a) **Irreducible**
 (b) **Impulse absent**
 (c) **Fluctuating**
 (d) **Dull**
 (e) **Non translucent**
 (f) **History of previous hernia**
 (g) **Signs of obstruction or strangulation**
 Treat **Herniotomy** (See under Hernia)
 Open the sac and drain the fluid
 (a) *After the protection of incision margins*
 & (b) *Before the treatment of obstructing factor*

(IV) NEW GROWTHS:

(1) *Benign*

- (A) **Lipoma of the cord**·
 Clinic **Multilobular soft tumour**
 (a) **Coming out of external ring**
 (b) **Moving with the testis**
 Compl **Traction hernia**
 Treat **Excision**
 (B) **Fibroma of the cord**
 (C) **Lymphangioma of the cord** :
 Syn **Diffuse hydrocele of the cord**
 Def **Collection of the fluid in the meshes of the connective tissues of the cord**
 Path **Diffuse mass of oedematous cellular tissues**
 Clinic (1) **Inguino scrotal swelling**
 (a) **Diffuse**
 (b) **Pyriform**
 (c) **Indentable**
 (d) **Non-cystic**
 (e) **Non reducible**
 (2) **Testis separate**
 Diff diag (a) **Varicocele**
 (b) **Filarial funiculitis**
 (c) **Hydrocele of the cord**
 (d) **Inguinal hernia**
 (e) **Other funicular growths**
 Treat **Excision**

(2) *Malignant*·

Secondary to malignant testis

(V) PAMPINIFORM AFFECTIONS:**(1) VARICOCELE:**

Def: Varicosity, tortuosity and elongation of the veins of pampiniform plexus of spermatic cord

Etio: (a) **Primary:**

: Congenital abnormality of venous walls

(b) **Secondary:** To back pressure

(a) Malignant kidney:

. Varicocele after 40

(β) Post operative:

. Post herniorrhaphy

Site: Left side:

(a) Anatomy of the spermatic vein.

. Entrance at right angles into renal vein

(b) Constipation: loaded colon

: Colon pressure over spermatic vein

(c) Hanging testis.

: Longer cord length

Age: (a) Primary: adolescents 15-25

(b) Secondary: (depends on the cause)

Clinic: (a) **Inguino-scrotal swelling:**

(1) **Worms-in-a-bag** feel

(2) Reducible: on lying down

(3) **Fills from below:** On standing up

(4) Impulse present

(b) **Testis:** separate, tender, hanging

(c) Neuralgia and neurasthenia

Compl. (1) **Thrombosis** of the pampiniform plexus

(2) Testicular neuralgia

(3) Neurasthenia

Treat. (A) *Conservative treatment*

(a) Cold bath

(b) Suspensory bandage

(c) Laxatives

(B) *Injection treatment.*

Pre treat Hot bath

Tech: (a) Reversed Trendelenburg or standing posture

(b) Operative preparation of the area

(c) Local anaesthesia

. Below the external ring

(d) Exposure of varicose vein:

(α) Blind prick

(β) Open dissection

(e) Aspiration of blood.

: To be sure of the vein

(f) Injection

(a) 4 c.cs. of quinine urethane

or (3) 2 c.cs. of 5% sod. morrhuate

(g) Support and rest

Result Painful thrombosis

↓ Subsidence in 3 or 4 days

↓ Cure in a few weeks

(C) *Operative treatment*

Ind (a) Public services

(b) Failure of conservatism

(c) Local condition progressive

(d) Neurasthenia not marked

Contraind (1) Marked neurasthenia

(b) Absence of disability

(c) Secondary varicocele

Tech (a) Inguinal or scrotal incision

(b) Excision of anterior group of veins
One inch length

(c) Suture of the stumps together

Post compl (a) **Neuralgia testis**

(b) Non amelioration

Neurasthenia(c) **Hydrocele** of tunica vaginalis(d) **Orchitis**(e) **Atrophy** of the testis(f) **Recurrence**

(g) Unintentional unilateral vasectomy

No effect

(2) PAMPINIFORM PLEXUS THROMBOSIS

Etio (a) Varicocele

+ (b) Trauma

(c) Torsion testis

(d) Contusion of the cord

Clinic (A) Acute

(B) Chronic beading separate from vas

Diff diag (A) Acute

(a) Acute epididymo orchitis

(b) Acute torsion spermatic cord

(B) Chronic

(a) T B epididymitis

(b) New growth of epididymis

(c) T B vas deferens

(3) PAMPINIFORM PLEXUS TRAUMA

Diffuse hæmatocele of the cord (See above)

(VI) GENERAL HYPERTROPHY OF THE CORD:

Associated with (a) Testicular swellings

(b) Tunica vaginalis effusions

(VII) POST-OPERATIVE CORD:**(1) PRESSURE**

Etio Hemorrhaphy

Path Small external ring

↓ Venous back pressure

Compl (a) **Vaginal hydrocele**

(b) **Atrophy testis**

(c) **Varicocele**

(2) NEURALGIA

Syn Neuralgia of the testis & scrotum

Etio Inclusion of ilio inguinal and genital nerves in sutures

(VIII) OPERATIONS ON VAS DEFERENS.**(1) Vasostomy**

Ind (a) Intractable vesiculitis

Vesicular lavage

(b) Vesiculography

(2) Epididymo Vasostomy

Ind Mechanical aspermia

Tech (a) Hagner's operation

Epididymo vasostomy

(b) Vaso Rete testis anastomosis

(3) Vasectomy -

Ind (a) **Rejuvenation: Steinach**

(b) **Enlarged prostate**

(c) **Threatened or recurrent epididymitis**

As a block to spread of the infection

(d) **T B testis**

(e) **Sterility: Bilateral**

Tech (a) Subcutaneous isolation

(b) Local novocain

(c) Incision 5"—1"

(d) Needle transfixation

(e) Isolation

(f) Excision as near the testis as possible

About 1 2 inches

(g) Ligation and carbolicisation both ends

(h) Drop in both ends

With septal partition to prevent union

(i) Closure of the wound

(IX) IMPORTANT POINTS**(1) Acute seminal vesiculitis**

Clinic (a) **Abnormal emissions**

Frequent, painful, blood stained

- Diff diag (b) P R tender mass
 (a) Acute prostatitis
 (b) Acute trigonitis
 (c) Acute posterior urethritis

Compl Epididymo orchitis

- (2) In cases of gonorrhœal obstructive sterility, seminal vesiculography gives graphic evidence as to the patency of the seminiferous pathway
- (3) Cure may be spontaneous in
 - (a) Complete congenital hydrocele
 - (b) Funicular hydrocele
 - (c) Infantile hydrocele
 - (d) Encysted hydrocele

These conditions require conservative methods primarily
- (4) *Reducible hydroceles potential hernias*
 - (A) *Congenital hydroceles of*
 - (a) Processus vaginalis
 - (b) Funicular process
 - (B) *Hydrocele of a hernial sac*
 Provided neck is not water tight
 - (C) *Bilocular hydrocele*
 From one pouch to the other
- (5) *Irreducible hydroceles*
 - (a) *Infantile hydrocele*
 - (b) *Encysted hydrocele*
 - (c) *Hourglass hydrocele*
 - (d) *Vaginal hydrocele*
 - (e) *Hydrocele of obstructed hernial sac*
- (6) Bilateral vasotomy should be done in every case of vesiculitis, when four months routine treatment has failed
- (7) In vas lavage and instillations be sure that the fluid is injected within the lumen and not outside its sheath
- (8) Induration combined with remarkable freedom from pain on palpation is the chief characteristic differentiating tuberculous from other forms of seminal vesiculitis
- (9) In primary varicocele, there is usually a late descent of the testis
- (10) *Most varicoceles give rise to no symptoms and so require no treatment, a small stationary primary varicocele, unknown to its owner should be ignored*
- (11) Varicocele may seem to be non-existent if examined in lying down position and in cold weather, it is exaggerated on standing and in hot weather
- (12) *Operation is successful in 80% of cases of varicocele but is liable to be followed by hydrocele or testicular atrophy*

- (13) In prostatectomy, pelvic cellulitis supervenes if seminal vesicles are injured
- (14) Pronounced spermatorrhœa or hæmospermia is due to vesiculitis.
- (15) *Tuberculosis starts primarily in vesicles*
- (16) Testis is enveloped in
 - (a) Congenital hydrocele or hernia of vaginal process
 - (b) Infantile hydrocele
 - (c) Bilocular hydrocele
- (17) Testis is separate and may or may not affect the movements of
 - (a) Encysted hydrocele
 - (b) Congenital hydrocele of funicular process
 - (c) Congenital hernia of funicular process
 - (d) Epididymal cysts
 - (e) Diffuse hydrocele of the cord
 - (f) Benign growths of the cord
- (18) *Any inguino scrotal swelling*
 - (a) *Inguinal hernia*
 - (b) *Spermatic cord affections*
- (19) *Differential diagnosis between*
 - (a) *Irreducible hydroceles of the cord*
 - (b) *Irreducible hernias*
- (20) *In every operation on inguinal region, take care of*
 - (a) *Pampiniform plexus*
Hæmatoma of the cord
 - (b) *Int spermatic and vas arteries*
Testicular atrophy
 - (c) *Ilio inguinal nerve*
Neuralgia
 - (d) *Torsion of the cord*
- (21) *Most common causes of acute funiculitis*
 - (a) *Acute torsion testis*
 - (b) *Filariaasis*
 - (c) *Gonorrhœal urethritis*
- (22) *Any swelling of the cord moves with testis*
- (23) *Varicocele appearing de novo after the middle age, examine kidneys*
- (24) Do not operate on varicoceles with marked neurasthenia.
- (25) Chief indication for operative treatment of varicoceles is entrance to public services
- (26) *Too tight external abdominal ring*
 - (a) *Vaginal hydrocele*
 - (b) *Atrophy testis*
 - (c) *Varicocele*

- (27) Differential diagnosis between :
- (a) Inguinal hernia : comes from above
 - (b) Varicocele : fills from below.
- (28) *Pathognomonic sign of varicocele is 'worm in the bag' feel.*
- (29) Acute endemic funiculitis is due to a streptococcal thrombo phlebitis of pampiniform plexus ; operation is imperative before the fourth day if death is to be averted.
- (30) In vasectomy :
- (a) Be sure that it is the vas that is excised
 - (b) Do not injure the arteries to the testis or vas.
- (31) Complications of vasectomy :
- (a) Psychological impotence
 - (b) Atrophy testis : (if arteries are injured)
 - (c) Neuralgia testis
 - (d) Continuance of propagation :
: If vas on one side escapes.
-

CHAPTER VIII

TUNICA VAGINALIS AND TESTIS

(A) THE TUNICA VAGINALIS

(I) CONGENITAL AFFECTIONS:

NON ISOLATION OF THE TUNICA VAGINALIS

Path Non obliteration of processus vaginalis at the apex of the testis, leading to tunica vaginalis cavity being continuous with the remaining processus vaginalis cavity and sometimes with the peritoneal cavity

Clinic (a) Congenital or infantile hydrocele
(b) Congenital hernia of vaginal process

(II) TRAUMA:

(1) TRAUMATIC HYDROCELE

Associated with traumatic epididymo orchitis

(2) TRAUMATIC HÆMATOCELE

Associated with trauma to the testis

(III) INFLAMMATION:

(A) *Acute*

(1) Primary acute vaginalitis

- (a) Polyserositis
- (b) Pneumococcal
- (c) Rheumatic

(2) Secondary vaginalitis:

Etio Acute epididymo orchitis

- (a) Traumatic torsion
- (b) Ascending
 - (α) Gonococcal
 - (β) B coli
 - (γ) Instrumentation
 - (δ) Tuberculous
- (c) Local Acute tuberculosis

(B) *Chronic*

Secondary to testicular affections.

- (a) Tuberculosis
- (b) Syphilis
- (c) Neoplastic
- (d) Chronic torsion

Complications of vaginalitis.

- (1) Inflamed hydrocele
- (2) Pyocele

Treatment of vaginalitis :

- (a) Rest and elevation
- (b) Counter irritation
- (c) Aspiration of inflamed persistent fluid
- (d) Treatment of underlying pathology

(IV) HYDROCELE :

Def : Collection of serous fluid in the Tunica Vaginalis

Etio . (A) *Secondary vaginal hydrocele :*

(1) Acute secondary hydrocele :

Cause Acute epididymo orchitis .

- (a) Traumatic ' acute torsion
- (b) Ascending infection
- (c) Acute tuberculosis

(2) Chronic secondary hydrocele :

Cause (a) Chronic epididymo orchitis :

- (a) Tuberculous
- (b) Syphilitic
- (c) Gonorrhœal
- (d) Chronic torsion

(β) Post operative

- (a) Herniotomy
- (b) Excision of varicocele

(B) *Primary vaginal hydrocele :*

(1) Acute primary hydrocele :

- (a) Polyserositis
- (b) Pneumococcal vaginalitis
- (c) Rheumatic vaginalitis

(2) Chronic Primary Hydrocele :**IDIOPATHIC HYDROCELE .**

Etio (a) Chronic trauma
Traumatic secretion

- (b) Low grade infection
- (c) Venous congestion
Due to gravity
- (d) Deficient absorption

Path (1) **Fluid :**

- (a) Amber coloured (straw coloured)
- (b) Albumin +
- (c) Fibrinogen +
- (d) Cholesterol crystals +

(2) **Tunica :**

- (a) Thinned
- (b) Thickened
- (c) Cartilaginous

- (3) **Testis**
 (a) Normal
 (b) Diseased
 (c) Atrophied
- (4) **Cord**
 Thickened
 Hypertrophy of cremaster muscle
- Clinic Purely scrotal swelling
 (a) Translucent (usually)
 (b) Cystic
 (c) Fluctuating or tense
 (d) Dull on percussion
 (e) Thrill
 (f) Testis enveloped
 (g) Cord palpable at ext ring
- Diff diag (A) **Irreduce inguino scrotal tumor**
 (a) Inguinal hernia
 (b) Hydrocele of the cord
 (α) Cord masked at ext ring
 (β) Scrot cannot be doubled
 (B) **Non translucent scrotal tumor**
 (a) Hæmatocele
 (α) Injury
 (β) Malignancy
 (b) Pyocele inflammation
 (c) Chylocele filariasis
 (C) **Testicular tumours**
 Enlarged testis
 (D) **Epididymal cysts.**
 (a) Cord normal at ext ring
 (β) Testis separate
- Compl (1) Trauma subcutaneous rupture
 (2) Herniation of hydrocele sac
 (3) Hæmatocele
 (4) Inflamed hydrocele
 (5) Pyocele
 (6) Testicular atrophy
 (7) Mechanical impotence
 (8) Eczema of scrotal skin
- Treat (A) *Secondary hydrocele*
 (1) Rest + support + counter irrit
 (2) **Aspiration**
 (3) Treatment of etiology
 (B) *Primary hydrocele*
 (1) **Aspiration or Tapping**
 (a) Avoid veins
 (b) Avoid testis
 (c) Avoid sepsis

(2) Aspiration + Injection :

Withdrawal of hydrocele fluid by means of a trocar and cannula and the introduction into the sac of a sclerosing solution, sufficiently irritating to produce an aseptic inflammatory reaction of the whole serous lining, ultimately ending in the obliteration of the cavity by fibrosis

Position	Supine
Tech	(a) <i>Translucency test</i>
	↓ (b) Tap and drain
	<i>Grasp the needle by Spencer Wells</i>
	↓ (c) Injection
	(α) Quinine urethane 8 c.cs.
	(β) Quinine urethane 5 c.cs
	↓ Lithocaine 5 c.cs.
	(γ) Lithocaine 8 c.cs
	(δ) 2 c.cs. of 6% Sod Morrhuate
	↓ (d) <i>Thorough massage</i>
After treat	Rest + elevation + support
	Re tapping after 4 days
Sequelæ	(a) Recurrence
	Tap + inject again
	(b) Hæmatocele
	(c) Testicular trauma
	(d) Epididymo orchitis
	(e) Infection → pyocele
	(f) Adhesions → loculations
	(g) Gangrene testis
Failure causes	(a) Incomplete evacuation of fluid
	(b) Failure to tap again within 4-6 days
	(c) Untapped loculus
	(d) Unsuitable solution
	(e) Too large a hydrocele
	(f) Chronic hydrocele with thick walls

(3) Operative treatment :

Ind	Idiopathic primary hydrocele
Incision	(a) Scrotal good for drainage
	(b) Inguinal good for asepsis
Tech	(A) Everstion of the tunica :
Ind	(a) Thin wall
	(b) No adhesions
	(c) Medium sized

- Tech (a) Incise the parietal layer
 (b) Evert the sac
 (c) Put in anchor suture
 (d) Return the testis
- (B) **(Partial) Excision of parietal layer :**
- Ind (a) Thick wall
 (b) Big size
 (c) Associated hernia
- Tech (a) Good hæmostasis
 All round running blanket suture
 (b) Avoid trauma to vas
 (c) Temporary drain
- Post treat Pressure bandage + elevation
- Post compl (a) **Difficult micturition :**
 Treat Aseptic catheterisation
 (b) **Hæmatoma scrotum :**
 Treat (a) Local anæsthesia
 (β) Trocar + cannula
 (γ) Syringe out the clot
 (δ) Elevation + pressure
- (c) **Infection**
 (a) Cellulitis scrotum
 (β) Abscess scrotum
 (γ) Epididymo orchitis
 (δ) Gangrene testis
- (d) **Torsion of the testis :**
 Treat Careful return of the testis
- (e) **Neuralgia testis :**
 Avoid inclusion of nerve
- (f) **Non-apposition of incision :**
 Careful sutures

(V) HAEMATOCELE.

- Def Collection of blood in Tunica Vaginalis
- Etio (1) Idiopathic • Blood diseases
 (2) **Traumatic :**
 (a) Blow or squeeze
 (b) Faulty tapping
- (3) Acute torsion testis
 (4) **Malignant testis**
- Clinic (A) *Acute hæmatocele*
 (1) **History of trauma**
 (2) Scrotal swelling
 (a) Non or semi translucent
 (β) Cystic
 (γ) Painful, tender, inflammatory
 (δ) **Retrogressive or intermittent size**

(B) *Chronic hæmatocele* :

- (1) History of trauma
- or (1) Malignant testis
- (2) Irregular consistency
- (3) Thickened smooth wall
- (4) Non translucent
- (5) Intermittent size
- (6) Loss of testicular sensation

Sign : (a) Aspiration : acute cases

(b) Incision : chronic cases

Diff diag (1) **Epididymo-orchitis** :

- (a) Acute or chronic
- (b) Septic or specific

(2) **Testicular neoplasm** :: *Malignant testis*(3) **Vaginal effusions** :

- (a) *Hydrocele*
- (b) *Pyocele*
- (c) *Chylocele*

(4) **Hernia**Compl (1) **Infection** :

- (a) *Pyocele*
- (b) Gangrene scrotum

(2) **Atrophy of the testis**

(3) Thickened tunica

Treat : (A) *Acute recent hæmatocele* :

(a) Conservative :

(α) Rest + elevation + cooling + pressure

↓ (β) Pot. iodide for absorption

(b) Manipulative

(α) Tapping

(β) Cannula—wash. (See above)

(γ) Incision → removal of clots

(B) *Chronic hæmatocele* :

(a) Excision of parietal tunica

(b) Orchidectomy

Ind (1) Old cases with no testicular sense

(2) Malignant testis

(3) Atrophy testis

(VI) PYOCELE :

Def : Collection of pus in Tunica Vaginalis

Etio : (1) Acute or chronic epididymo-orchitis :

- (a) Traumatic : torsion
- (b) Infective : septic
- (c) Specific : tuberculous, syphilitic

(2) **Infected vaginal effusions** :(a) *Hydrocele*

(b) Hæmatocele

(c) Chylocele

(3) **Pyæmia** : Pyæmic effusion

(4) Post operative . infection

Clinic : (A) Local :

: Inflammatory cystic scrotal swelling

(B) General :

: Septic toxæmia

: (Mild as compared to quantity of pus)

Diff diag : (1) **Acute epididymo-orchitis**

(2) Testicular malignancy

(3) **Acute vaginal effusions** :

(a) Acute hydrocele

(b) Acute hæmatocele

(4) **Strangulated hernia**(5) **Cellulitis scrotum** :

(a) Extravasation of urine

(b) Filariasis

Treat : (1) General : **Sulphonamides**

(2) Local :

(a) Aspiration

(b) Incision + drainage

(VII) CHYLOCELE :

Def : Collection of chyle in Tunica Vaginalis

Etio : (a) Filariasis

(b) Malignant infiltration of lymphatics

Clinic : (1) **Scrotal swelling** :

(a) Non translucent

(b) Cystic

(2) **Lymphatic œdema** :

(a) Thickened cord

(b) Elephantiasis scrotum and/or penis

Compl : Recurrent streptococcal inflammation

Treat : (1) Tapping

(2) Excision :

(a) Parietal tunica

(b) Scrotal elephantiasis

(B) THE TESTIS**(1) CONGENITAL AFFECTIONS :**(1) **Anorchism** : Absence of both testes(2) **Monorchism** : Solitary testis (exclude retained testis)(3) **Polyorchism** . Extra testis

: Epididymal cyst mistaken for third testis

(4) **ANTERIOR INVERSION** :

Def : Physiological torsion of the testis

Etio 1 in 20

Clinic Epididymis in front of testis

Point Remember in tuberculous epididymitis

(5) HYPO AND MAL DESCENT OF TESTIS;

Syn Retained and ectopic testis

(A) *Imperfect descent*

Class (1) **Normal variations :** (Dennis Browne)

(a) **Adult :** Scrotal bottom

(b) **Low retractable :** 'Rabbit' testis

(a) Into superficial inguinal pouch

(β) Lower limit normal (a)

(c) **High retractable :**

(a) Into superficial inguinal pouch

(β) Lower limit higher than (a)

(2) **Retention testis :**

(a) **Mechanical retention :**

(a) Normal general development

(β) Normal genital development

(b) **Delayed development retention :**

(a) Normal general development

(β) Sub normal genital development

(c) **Endocrinal retention :**

(a) Sub normal general development

(β) Sub normal genital development

Sites (A) **Abdominal** (Lumbar and Iliac)

(a) Bilateral cryptorchism

(b) Unilateral pseudo monorchism

(B) **Inguinal :**

(a) Entrant inguinal

At the internal ring

(b) Middle inguinal

(c) Emergent inguinal

At the external ring

(C) **High Scrotal :**

Scrotal testis which cannot be made to touch the scrotal bottom

• Causes (1) **Inadequate gonadotropic hormone :**

Anterior pituitary

(2) **Mechanical retention**

Path (a) No spermatogenesis

(b) Normal internal secretion

Clinic : (1) **Absence from the scrotum**

(2) Presence in one of the above sites

(3) **Non-bottom-touching testis**

Diff. diag: (1) **Rabbit testis:**

Diag: (a) Childhood

(b) Testis in superficial inguinal canal

(c) *Testis touches the bottom:* on

(a) Traction

(β) Application of hot water bag:

. To groin, scrotum and perineum

(2) **Tumour:**

(a) Abdominal

(b) Inguinal

(c) Scrotal

Diag. Absence of testis from the scrotum

(3) **Hernia:** *Always present actual or potential*

(B) *Misplaced or ectopic testis.*

Etio: Abnormal gubernacular drag

Sites: (a) **Cruro-scrotal:**

: External abdominal ring

(b) **Superficial inguinal:**

: Over the Poupart's ligament

: In superficial inguinal pouch

Rabbit testis

(c) **Femoral:**

: Scarpa's triangle

(d) **Pre-penile:**

(a) Symphysis pubis

(β) Root of the penis

(e) **Perineal:**

In the perineum

(f) **Pelvic**

Path. (1) Spermatogenesis present

(2) Internal secretion present: except in (f)

Clinic: (1) Absence from the scrotum

(2) Presence in one of the above sites

Complications of retained and ectopic testis:

: (1) Sterility in cryptorchids

(2) **Trauma:**

(a) Inflammation

(b) Atrophy

(c) Malignancy

(3) **Torsion:** of the spermatic cord

(4) **Associated hernia or hydrocele**

(5) **Abdominal crisis:**

: Urethritis → epididymo orchitis

: In abdominal retention

- (6) **Malignancy**
- Treat (A) **True cryptorchid: Bilateral abdominal testes**
 (a) Watch after 9th year
 (b) Hormone therapy: 10-12 years
 (c) Orchiopexy: 12 to 14 years
- (B) **Uncomplicated canal-dwelling testis:**
 (a) Hormone therapy 10-12 years
 (b) Orchiopexy 12-14 years
- (C) **Complicated canal dwelling testis:**
 (a) If complication requires treatment:
 Early treatment + orchiopexy
 (b) If complication requires no treatment:
 (a) Hormone therapy 10-12 years
 (β) Orchiopexy + complication treat.:
 12-14 years
- (A) **Denis Browne's normal variation:**
 Hormone therapy
- (B) **Mechanical retention:**
 Orchiopexy
- (C) **Delayed development retention:**
 Hormone therapy 10-12 years
- (D) **End**
 (a)
 (b)
- (1) **Expectant treatment:**
 Spontaneous descent of the testis may be
 expected to occur very frequently
 Normal time to descend
 (a) End of first year
 (b) Upto 9th year
 (c) At puberty: upto 14 years
- (2) **Hormone treatment**
- Ind (a) Cryptorchid or canal dwelling testis
 (b) Denis Browne's normal variation
 (c) Endocrinal retention
 (d) Every case between 10-12 years:
 Except mechanical retention
- Contraind (a) Purely mechanical retention
 (b) Age below 10 years
- Age **Between 10 and 12 years**
- Injections (1) **Pregnyl**. 500 units
 . Intramuscular daily for one month
 (2) **Antuitrin S:**
- Compl. **Precocious puberty**
- (3) **Operative treatment:**
 Ind: (a) Purely mechanical retention

- (b) Associated complications
- (c) Failure of conservatism .
One year after hormone treatment
- (d) Age **before 14 years (10-14)**

Operations (A) Orchiopexy :

- Tech** (1) *Inguinal herniotomy*
 ↓ (2) Isolation of the cord with testis
 ↓ (3) Lengthening of the cord
 (a) Internal mobilisation
 Strip iliac peritoneum medially
 ↓ (b) *Internal transplantation*
 Bring testis and cord out through
 an opening in conjoint tendon
 just behind the external ring
 ↓ (c) *Straightening*
 Divide all vessels and fibrous
 tissue except vas and its artery
 ↓ (4) *Orchiopexy*
 (a) Keetley Torek
 Anchorage to the thigh
 (b) Ombredanne or Maucclair
 Trans-septal
 (c) Bottom mattress suture
 + (5) *Herniorrhaphy*

- Post compl** (a) **Recurrence**
 (b) **Atrophy**

(B) Orchidectomy .

- Ind** (a) Disorganised or diseased testis
 + (b) Normal other testis

(C) Orchio-Cælioplasty

- Tech** Return of testes into abdominal cavity

- Ind** Both testes
 (a) Incompletely descended
 (b) Irreplaceable in the scrotum

- Contraind** Abdominal crisis as a complication
 of urethritis, in post operative life

- Result** (a) Internal secretion present
 (b) Spermatogenesis lost.

(II) TRAUMA :

(1) TORSION TESTIS

- Etio** (1) Normal testis
 (2) Misplaced or retained testis

Predisp (A) Congenital abnormalities :

- (a) Incomplete or mal descent

		(b) Patent processus vaginalis	
		(c) Anterior inversion	,
		(d) Horizontal testis	
		(e) Presence of mesorchium	
		(f) Pedicled hydatid of Morgagni	
	+ (B)	Accidental strain Leading to	
		(a) Cremaster contraction	
		(b) Venous engorgement	
	(C)	Post operative	
		Careless replacement of exteriorised testis	
Age	(a)	Early infancy	
	(b)	Between 16 and 30 years	
Pathology			
Factors	(a)	Complete investment by tunica	
		Of testis epididymis and cord	
	(b)	Bell hanging of testis and adnexa	
	(c)	Spiral cremasteric attachment	
Sites	(a)	2-5 cms above the summit of testis	
	(b)	Between testis and epididymis	
	(c)	Hydatid of Morgagni	
Varieties	(a)	Horizontal	
	(b)	Vertical	
Morb anat	(a)	Congestion	
	↓ (b)	Thrombosis	
	↓ (c)	Infarction	
	↓ (d)	Gangrene	
	or (e)	Fibrosis with atrophy	
Clinic	(A)	Acute Strangulated hernia syndrome	
		(a) Acute inguino scrotal inflammation	
		(b) Shock + pain + vomits	
	(B)	Subacute Epididymo orchitis syndrome	
	(C)	Chronic Recurrent testicular crises	
		(a) Subacute local signs	
		(b) Relief after manipulations	
Signs		Abnormal position of epididymis	
	(a)	Horizontal torsion	
		Epididymis anterior or internal	
	(b)	Vertical torsion	
		Globus major down	
Diff diag	(1)	Scrotal abscess	
	(2)	" " " " " "	
	(3)	" " " " " "	
	(4)	Acute abdomen	
Compl	(1)	Gangrene testis	
	(2)	Pyocele	
	(3)	Atrophy testis	

Treat: (A) Manipulative correction:

- Ind: (a) Early cases
 (b) Recurrent cases
 (c) Fully descended testis

Tech: Rotation from within outwards & upwards

Result: Relief of pain

Guide: Relief or worsening of pain

(B) Operative correction + fixation:

- Ind: (a) Failure of manipulations
 (b) Not very early cases
 (c) Fully descended testis
- Tech. (1) Exposure
 (2) Correction of torsion
 (3) Fixation of testis:
 : Fine silk mattress sutures
 : Lateral and medial

(C) Orchidectomy:

- Ind: (a) Gangrene testis
 (b) Retained or ectopic testis
 (c) Thrombosis of the cord vessels

(D) Excision of hydatid:

Ind: Torsion of the hydatid

(2) CONTUSION TESTIS.

Etio. Blows or squeezes

- Clinic: (a) History
 (b) Severe shock + vomits
 (c) Extreme pain + tenderness
 (d) Traumatic epididymo orchitis

- Compl. (1) Hæmatocele
 (2) Infection:
 (a) Pyocele
 (b) Epididymo orchitis

- Sequelæ (1) Atrophy testis
 (2) Malignancy:
 (a) Real
 (b) Pseudo:
 : Trauma draws attention to already present malignancy

Treat: (a) Rest + elevation + support + cooling
 ↓ (b) Counter irritants + support

(3) LACERATION AND WOUNDS**(4) PROLAPSE TESTIS:**

- Etio: (a) Bull gore
 (b) Mill accidents

Path: Exposure of the testis due to avulsion or laceration of the scrotum

- Treat (A) Conservative
 (a) Debridement + toilet
 ↓ (b) Replacement
 ↓ (c) Drainage
 (B) Orchiectomy
 Ind (a) Gross laceration
 (b) Gross infection

(III) INFLAMMATIONS EPIDIDYMO ORCHITIS

(1) TRAUMATIC EPIDIDYMO ORCHITIS

- Etio (a) Contusion
 (b) Laceration
 (c) Torsion
 (d) Strain
 (a) Cremaster contraction
 (β) Pampiniform thrombosis
 (γ) Subacute torsion
 (e) Post manipulative
 (a) Urethral instrumentation
 (β) Prostatectomy
 (ι) Rectal operations

(2) INFECTIVE EPIDIDYMO ORCHITIS

- Types (A) Primary Through the blood stream
 (a) Mumps
 (b) Tuberculosis
 (c) Syphilis

(B) Secondary or ascending

- Infection (a) Gonococcal
 (b) B coli
 (c) Tuberculosis
 (d) Pyococcal
 From (a) Urethra
 (b) Prostate
 (c) Vesicles
 Via Vas deferens
 (a) Lumen
 (b) Perivas lymphatics

Sites (A) Epididymitis

- Etio Urethral sepsis
 Path Ascending infection
 Route (a) Anterior urethra
 ↓ (b) Posterior urethra
 ↓ (c) Prostate + vesicles
 ↓ (d) Vas deferens lumen or lymphatics
 ↓ (e) Epididymis
 Globus minor → globus major
 Bact (a) Gonococcal
 (b) B-coli

(c) **Pyococcal instrumentation**(d) **Tuberculosis**: Ascending**(B) Epididymo → orchitis :**

(a) Ascending infection (See above)

(b) Tuberculosis blood stream

(c) **Mumps**: Blood stream

(d) Syphilis blood stream

(C) Orchitis :

Etio Blood borne infections

(a) Tuberculosis

(b) **Syphilis**(c) **Mumps**

(d) Gout

(e) Typhoid

(f) Zymotic

- Clinical types (1) Acute acute inflammatory signs
 (2) Subacute
 (3) Chronic adhesions, nodules, indurations
 (4) Recurrent inflammatory crises

Clinic (A) **Local :**

- (a) Painful, tender, enlarged swelling
 Epididymis and/or testis body
 (b) Associated or non associated hydrocele
 (c) Swollen, inflamed cord
 (d) Inflamed scrotum
 (e) Nodules, indurations, softenings, sinuses.
 In chronic cases

(B) General :

Varying amount of toxæmia

(C) Etiological :

- (a) *Urethritis* urethral examination
 (b) Prostatitis or vesiculitis P R.
 (c) Parotitis

*Signs and symptoms depend on clinical types*Compl (a) **Vaginal effusions :**

- (a) Hydrocele
 (β) Pyocele
 (b) Gangrene of the testis
 (c) Hernia testis
 (d) Atrophy testis
 (e) Sterility if bilateral

Treat (A) **Conservative .**(1) **Primary cause :**

- (a) Stop all manipulative treatment
 (b) Urinary flushing and antiseptics

(2) **General :**

- (a) Antiseptic Sulphonamides
Vaccines
- (b) Symptomatic Empirin
Suppositories

(3) **Local :**

- (a) Support + elevation
Bridge of adhesive plaster
- (b) Thermo therapy
 - (a) *Lead lotion* or ice bag
 - Ind (1) Traumatic inflammation
 - (2) Within 48 hours
 - (β) Fomentations
 - Ind (1) Infections
 - (2) After 48 hours
- (c) Counter irritants or passive congest.
Scott's dressing
- (d) Punctures of epididymis
If pain and tenderness
- (e) Puncture of the vaginal effusion

(4) **Special :**

- (a) Gonococcal epididymo orchitis
10% calcium gluconate 5-10 c.cs
Intravenous
Daily for 3 days
↓ Alternate dry for 10 days
- (b) Mumps orchitis
 - (a) Convalescent serum
 - (β) Epididymal decapsulation

(B) **Operative**(1) **Incision and drainage .**

Of pyocele

(2) **Epididymis decompression .**Ind (a) Non amelioration of symptoms
and signs by 4th day

(b) Acute coli epididymitis

Tech (a) Spinal anaesthesia

(b) Preparation of scrotum

Avoid iodine

(c) Lateral incision into the testis coverings

(d) Exposure of the whole epididymis and
origin of the cord(e) Isolation, catheterisation and silk-strand
drainage of the vas

(f) Incision of hydro or pyocele

(g) Incise & explore the whole epididymis

(h) Drainage of epididymis and the tunica

(3) SPECIFIC EPIDIDYMO-ORCHITIS:

(A) TUBERCULOSIS:

Etio Young adults: 20-30 years

Path: (1) **Primary:**

Site Globus major

Route Blood stream

(2) **Secondary:**

Site: Globus minor

Route. Vas deferens:

(a) Lumen

(β) Peri lymphatics

Primaries: (a) Kidney

(b) **Seminal vesicle**

(c) Prostate

Course Ultimately bilateral

Morb anat: (a) Tubercle formation

↓ (b) Conglomeration

↓ (c) Caseation

↓ (d) Abscess formation

↓ (e) Secondary infection

↓ (f) Sinus formation

Clinical types: (a) Acute

(b) Subacute

(c) Chronic

Signs: (1) **Globi: Major or minor**

(a) **Tender nodule**

↓ (b) **Small fluctuating swelling**

↓ (c) **Sinus with adhesions and fibrosis:**

(a) At the postero inferior angle

(β) Anteriorly. (if ant. inversion)

(2) **Epididymis:**

. **Tender, enlarged, irregular, craggy**

: With fluctuating and nodular areas

(3) **Testis body:**

(a) Normal (in early cases)

(b) Testicular sensation present

(4) **Tunica vaginalis:**

: Small hydrocele: in 30% cases

(5) **Vas deferens:**

(a) Normal: in early primary cases

(b) Beaded:

(a) In secondary cases: ascending

(β) In late primary cases: descending

(6) **Other testis:**

: Sometimes affected

- (7) **Rectal examination :**
T. B prostate and seminal vesicles
 - (8) **Kidneys :**
Affected if primary focus
 - (9) **Other tuberculous manifestations :**
 - (a) Lungs
 - (b) Bones
 - (c) Lymph glands
 - (d) Intestines
 - (10) **Urine examination :**
 - (a) Acid sterile pyuria
 - (b) Cultural examination
 - (c) Guinea pig inoculation test
- Diff diag (1) Any other kind of epididymo orchitis .
- (a) Acute
 - (b) Sub acute
 - (c) Chronic
 - (d) Traumatic
 - (e) Septic
 - (f) Specific gonorrhoeal, syphilitic
- (2) Testicular growths
- (3) Vaginal effusions
- Compl (a) Suppuration → sinus
- (b) Fibrosis → atrophy
- (c) **Spread to genito-urinary system**
- Treat . (A) *Acute tuberculous testis*
: **Conservative & symptomatic**
- (B) *Chronic tuberculous testis*
- (a) **Conservative :**
 - Ind (a) Very early cases
 - (β) Very late cases
 - (γ) Involvement of other organs
- Tech General anti tuberculous
- (b) **Operative**
 - (1) **Scraping tuberculous sinuses**
 - (2) **Vasectomy :**
 - Ind Preventive to the spread
 - (3) *Epididymectomy :*
 - Ind (a) Localised disease
 - (b) Bilateral disease
 - (c) Solitary testis disease
 - (4) **Orchidectomy :**
 - Ind Unilateral advanced disease
- Contraind; (a) T. B prostate or vesicle
- (b) *Bilateral affection*

(5) **Young's radical operation :**

Ind: (a) Unilateral advanced disease

+ (b) Good general condition

Tech. (A) Preliminary vasectomy :

: Of the other side

↓ (B) Perineal stage :

: Excision of . Prostate

. Vesicles

. Ampullæ

: Lower vas

↓ (C) Inguinal or scrotal stage .

: Excision of Vas deferens

. Epididymis

: Testis

. Scrotum

(B) **SYPHILIS**Path (A) *Congenital :*(a) **Diffuse :**

(a) Painless, bilateral orchitis

↓ (β) Atrophy of the testes

(b) **Local gumma :**

(a) Granuloma

↓ (β) Infection

↓ (γ) Ulceration

↓ (δ) Fungation testis

(B) *Early secondary :*. Painless, bilateral, subacute orchitis
(Rarely globus major of epididymis)(C) *Intermediary or late secondary :*

As in (B)

(D) *Tertiary :*

(a) Local gumma → Hernia testis

(b) Diffuse fibrosis → Atrophy

Clinical stages of gumma of the testis :(A) *Tumour stage .*(a) **Enlargement of testicular body :**

(a) Painless and non tender

(β) Heavy

(γ) Smooth and globular

(δ) Firm

(b) **Early loss of testicular sensation**

(c) Small hydrocele

(d) Other tissues normal

↓ (B) *Adhesion stage* :
: Red, brawny scrotal skin and subcutaneous tissues, adherent to the anterior aspect of the enlarged testis

↓ (C) *Abscess stage* :
(a) Fluctuation
(b) Subacute inflammation

↓ (D) *Ulcer stage* :
(a) **Sloughy stage** :
(a) Wash leather slough
(β) Gummy discharge
(b) **Clean stage** :
: Round, punched out, clean cut ulcer on the anterior aspect with testis in the floor

↓ (E) *Hernia testis stage* :
: Testis covered by granulations protruding through the ulcer

Diagnosis: (1) **Relative painlessness**
(2) **Anterior aspect**
(3) **Open ulcer: Round**
(4) **Wash-leather slough**
(5) **Gummy discharge**
(6) **Loss of testicular sensation**
(7) **Other stigmata**
(8) **Effect of pot. iodide**

Diff diag (a) Other causes of **epididymo-orchitis**
(b) **Tunica vaginalis effusions** : **Pyocele**
(c) **New growths of the testis**

Treat (A) **Anti-syphilitic**
(B) **Orchidectomy**
Ind. (a) **Resistant cases**
(b) **Hernia testis**
(c) **Atrophied or disorganised testis**

(C) **GONORRHOICAL EPIDIDYMO ORCHITIS** :
: (See under infective)

Clinic. (a) **History**
(b) **Urethritis** : Present or past
(c) **Epididymo orchitis**

Signs. (a) **Urethral discharge smear** : gonococci
(b) **Prostatic and vesicular massage**

Compl: **Epididymal fibrosis** → **sterility**

Treat. (a) **As in infective epididymo-orchitis**
+ (b) **Intravenous calcium gluconate** :
: (See above)

(D) MUMPS ORCHITIS

Etio Parotitis

Time (a) Between 6th to 11th day of parotitis

(b) Before parotitis

Age 8-25 years

Clinic (a) Parotitis

(b) Orchitis duration 4 days

(α) Unilateral, painful, tender, hard swelling of
the body → may spread to opposite side

(β) Secondary hydrocele

Sequelæ (a) Resolution

(b) Atrophy

(c) Sterility + impotence + infantilism
If bilateral atrophy

(d) Hydrocele

Treat (a) Convalescent serum

(b) Rest + warmth + support

(c) Epididymis decompression

(d) Steinach or Voronoff

If atrophy

(4) HERNIA TESTIS

Syn Fungus testis

Def Prolapse of a diseased testis through the tunica
albuginea and overlying scrotum

Etio (1) **Syphilis** : Gumma

(2) Abscess

(3) **Trauma** : Prolapse

(4) Ulcerating malignancy

Clinic Prolapse of granulations-lined testis :

Through an ulcerating scrotum

Treat (1) **Orchidectomy** with overlying scrotal excision

(2) Anti syphilitic treatment in gumma

(3) Plastic operations in traumatic prolapse

(5) GANGRENE OF THE TESTIS

Etio (a) **Acute torsion**

(b) Acute orchitis

(c) Acute pyocele

Clinic (a) Acute inflammatory local signs

(b) Acute septic toxæmia

Sequela Fungus testis

Treat (a) **Orchidectomy** + drainage

(b) Incision → drainage

(IV) NEW GROWTHS:

(A) *Innocent* rare

Fibroma, osteoma myoma, adenoma

(B) *Malignant* : common

Etio: (1) Trauma

(2) Imperfect descent and mal descent ?

Path: (A) **TERATOID GROWTHS:**

: All three germinal layers

Etio (a) Frequency: **50%** of testis tumours

(b) Age: **20-40 years**

Sub types: (1) **Tridermal teratoma:**

. Fibrocystic disease

(2) **Solid, homogenous teratoma**

(3) **Unidermal teratoid growths:**

(a) **Hypoblastic:**

(a) Papillary adeno-fibroma

(β) Adeno carcinoma

(γ) Spheroidal carcinoma

(b) **Mesoblastic:**

(a) Cartilaginous

(β) Myxomatous

(γ) Mixed

(δ) Sarcoma

(c) **Epiblastic:**

(a) Dermoids

(β) Squamous carcinoma

(γ) Basal carcinoma

(δ) Chorion epithelioma

(4) **Dermoids:**

: Congenital

. Contain sebum, hair, epithelium

Origin. Primitive undifferentiated **totipotent meso-
thelium** of genital ridge

Metastases: (1) **Lymphatic:** In carcinoma

(a) Along spermatic artery

(b) Lumbar para aortic glands

(c) Mediastinal glands

(d) Supra clavicular glands

(2) **Blood-stream:**

. In sarcoma, chorion epithelioma and
late stages of carcinoma

(a) Lungs

(b) Liver

(c) Bones

(B) **SEMINO CARCINOMA:** Germinal cell tumours

Etio: Age: **40-50 years**

Frequency: **49%** of testis tumours

Path	(1) Columnar celled (2) Spheroidal celled
Origin	(a) Germinal epith of seminiferous tubules (b) Epiblast in teratoid growths
Metastases	Lymphatics and lymph glands (a) Lumbar para aortic (b) Mediastinal (c) Supra clavicular also by blood stream to lungs, liver and bones

(C) SARCOMA

Etio	Frequency 1% of testis tumours
Path	(a) Round celled (b) Spindle celled (c) Lympho sarcoma
Origin	Mesoblastic tissue in (a) Normal testis (b) Teratoid growths

(D) CHORION EPITHELIOMA

Etio	Not very common
Origin	Teratoid growths

Clinical course .

- (1) Painless, irregular swelling of the testis
- (2) Gradual, steady, **progressive** enlargement
- (3) Epigastric dyspepsia
Para aortic metastases
- (4) Mediastinal syndrome intra thoracic metastases
(a) Shortness of breath
(b) Retro sternal fullness
- (5) Supra clavicular swelling
Supra clavicular metastases (personal cases)

Signs (A) Local

- (1) **Scrotum :** (normal in early stages)
 - (a) *Adherent, large dilated veins*
 - (b) Lymphatic œdema
 - (c) Fungation
 - (d) Ulceration
- (2) **Body of the testis :**
 - (a) Uniform → nodular, *irregular*, bossy
 - (b) Hard or soft or pseudo fluctuating
 - (c) *Heavy*
 - (d) Loss of testicular sensation
- (3) **Epididymis .**
Flattened out and impalpable

- (4) **Tunica vaginalis :**
Secondary hæmatocele in 15%
- (5) **Spermatic cord :**
Hypertrophied and infiltrated
- (6) **Vas deferens :**
Normal

(B) *Distant*(1) **Abdominal .**

- (a) *Para umbilical lumbar swellings*
- (b) *Ascites*

(2) **Chest :**

- (a) *Signs of retro sternal pressure*
- (b) *λ Ray lungs*

(3) **Supra clavicular region :***Supra clavicular adenopathy*

Two personal cases within 3 months of each other
 Patient coming for supra-clavicular mass, testicular
 tumour not complained of by the patient found
 on routine examination

(C) *General**Cancerous cachexia*(D) *Special*

- (a) *Hormone test Prolan A in urine*
Syn Aschheim Zondek or Friedman

Results (α) *Less than 500 units*(1) *Teratoma*(2) *No malignancy*(β) *Between 500 — 1500 units*
Seminoma(γ) *Between 2000 — 10000 units .*
Embryonal carcinoma(δ) *More than 10000 units*
Chorion epithelioma(b) *X Ray chest For secondaries*(c) *Biopsy Exploration**Individual syndrome*(1) **Teratoma : 50%**(a) *Young age 20-40*(b) *Smooth, elastic, symmetrically enlarged*(c) *Shape of normal testis*(d) *Epididymis normal*(e) *Metastases lymphatic and lungs*(2) **Seminoma : 49%**(a) *Age 30 to 50 , rare in old age*(b) *Irregular, bossy enlargement*

- (c) Metastases: lymphatic
- (3) **Sarcoma: 1%**
 - (a) Rapid growth
 - (b) Blood metastases: lungs
- (4) **Chorion epithelioma:**
 - (a) Metastases in:
 - (α) Lungs
 - (β) Supra clavicular
 - (b) Pregnancy signs:
 - (α) Gynæcomastia
 - (β) Morning sickness
 - (c) Positive pregnancy test:
 - : Prolan A in urine

Diff. diag: (1) **Hæmatocele**

(2) **Hydrocele**

(3) **Orchitis:**

- (a) Septic
- (b) Syphilitic
- (c) Tuberculous
- (d) Gonorrhœal

(4) **Hernia testis**

Treat: (1) **Radical operation:**

Ind: Every case with no contra indication

Contraind: (a) Local: nil

(b) Regional. metastases

(α) Abdominal: adenopathy

(β) Chest: lungs

(γ) Neck: adenopathy

(c) General. cachexia

Tech: Removal of:

(a) Half of the scrotum

(b) Testis

(c) Spermatic cord

(d) Whole of the spermatic vein

(e) Para aortic lymph glands

(f) Para aortic cellular tissue:

: From renal art. to common iliac art.

(2) **Combined treatment:**

(A) Orchidectomy + excision cord:

. Upto internal abdominal ring

↓ (B) Deep X-Rays:

. To abdominal lymph area

↓ (C) Radium bomb:

. To the groin

(3) **Deep X-Rays:**

Ind: Seminomata

(V) MISCELLANEOUS TESTICULAR SYNDROME:

(1) **ATROPHY OF THE TESTIS:**

Etiology: (A) Inflammatory:

- (a) Traumatic: torsion
(b) Syphilitic
(c) Mumps

(B) Degenerative :

- (a) Vascular: late varicocele
- (b) Nerve lesions:
 - (α) Fracture spine
 - (β) Myelitis
 - (γ) Tabes dorsalis
- (c) Pressure:
 - (α) Hæmatocoele
 - (β) Hernia
 - (γ) Post operative:
: Tight ring
- (d) Constitutional:
 - (α) Diabetes
 - (β) Leukæmia

Clinic: Soft, flabby, small testis

Sequelæ: (a) Sterility: if bilateral
(b) Impotence. if bilateral
(c) Neurasthenia

(b) Impotence, if bilateral

(c) Neurasthenia

Treat: (1) Vasectomy Steinach
(See under Endocrines)

(See under Endocrines)

(2) Voronoff. Testicular graft
(See under Endocrines)

. (See under Endocrines)

(2) NEURALGIA OF THE TESTIS

Def Paroxysmal testicular pain and tenderness

Etiol. (a) Primary idiopathic: ? sexual

(b) Secondary

(a) Testicular lesions :
: Gonorrhœal epididymo orchitis

: Gonorrhoeal epididymo orchitis

(β) Adnexa lesions :

(1) *Varicocele*

(2) *Urinary calculus*

(r) Distant lesions :

(1) Spinal caries

(2) New growths

(3) MALE STERILITY AND IMPOTENCE:

Etiology: (1) Impotence

(a) Congenital malformations:
: Pseudo-hermaphroditism

: Pseudo-hermaphroditism

- (b) Mechanical:
 - : Large hydrocele
 - : Elephantiasis scrotum
- (c) Psychic
- (d) Nervous:
 - : Tabes dorsalis
 - : Spinal fractures
 - : Pituitary dysfunction
- (e) Diseases:
 - (a) Local atrophy
 - (3) General diabetes
- (2) Azoospermia Lack of sperms in semen
 - (a) Cryptorchid
 - (b) X-Ray exposures
 - (c) Vasectomy bilateral
- (3) Aspermia Lack of semen
- Causes: (a) Urethral obstruction
- (b) Vas obstruction . vasectomy
- (c) Epididymo-orchitis
- Treat: (1) Hagner's operation
 - : Anastomosis of vas with epididymis
- (2) Vas Rete testis anastomosis
- (3) Rejuvenation:
 - : (See under Endocrines)

(VI) EPIDIDYMAL CYSTS:

- Etio: (a) Young adults
- (b) Over 40
- Class: (1) Vestigial cysts
- (2) Retention cysts
- (3) Polycystic disease
- Varieties: (A) SPERMATOCELE: Retention cyst
 - Etio: Men under 40
 - Site: Globus major
 - Contents: 'Barley' fluid with spermatozoa
 - Clinic: (a) Cystic swelling at the top of the testis:
 - (1) Single
 - (2) Unilocular
 - (3) Unilateral
 - (4) Big
 - (5) Soft
 - (6) Cystic
 - (7) Translucent
 - (b) Testis separate
 - (c) Pull on testis moves the cyst
- (B) VESTIGIAL CYST:
 - Etio. Men over 40
 - Site: Globus major

Contents: Crystal-clear fluid

- Origin: (a) Hydatid Morgagni
 (b) Vas aberrans of Haller
 (c) Organ of Giraldes
 (d) Vas efferens

- Clinic: (a) Cystic swellings at the top of the testis:
 (1) Multiple
 (2) Multilocular
 (3) Bilateral
 (4) Small
 (5) Cystic
 (6) Translucent
 (b) Testis separate
 (c) Pull on testis moves the cysts

(C) POLYCYSTIC DISEASE:

: Whole of the epididymis turned into an agglomeration of multiple small cysts

- Diff. diag: (1) Encysted hydrocele of the cord
 : Inguino scrotal
 (2) Vaginal hydrocele.
 : Testis enveloped

- Treat: (1) Leave alone
 (2) Aspiration
 (3) Tapping + injection
 (4) Excision of the cyst
 (5) Epididymectomy. in polycystic disease

(VII) HYDATID OF MORGAGNI:

- Anat: (a) Sessile
 (b) Pedunculated

- Path. (a) Torsion
 (b) Cyst

- Clinic. (a) Torsion testis mulder symptoms
 (b) Epididymal cyst

Treat. Excision

(VIII) OPERATIONS ON TESTIS:**(1) ORCHIDECTOMY:**

- Ind: (1) Undescended or mal descended testis
 (2) Gunshot wounds and contusions
 (3) Torsion → gangrene
 (4) Tuberculosis of testis:
 : Epididymectomy if early or bilateral
 (5) Gumma testis
 (6) Fungus testis
 (7) New growths
 (8) Old hæmatocele:
 : With atrophy of the testis

Tech (A) Simple orchidectomy :

- Steps (a) Incision over external ring
 (b) Exposure of spermatic cord
 (c) Blunt isolation of the cord
 (d) Two transfixion ligatures
 No 2 chromic
 (e) Division of the cord
 Distal to distal ligature
 (f) Removal of the testis
 Division of gubernaculum
 (g) Drainage

Post-compl Slipped ligature → hæmorrhage

(B) Radical orchidectomy

Ind Malignant testis

Route Extraperitoneal

- Steps (a) Incision
 (1) Scrotum
 ↓ (2) Inguinal canal
 ↓ (3) Ant superior spine
 ↓ (4) Tip of 10th rib
 (b) Division of abdominal muscles
 (c) Medial displacement of peritoneum
 (d) Dissection & removal of
 (1) Para-aortic lymph glands
 (2) Para aortic cellular tissues
 From renal to common iliac art.
 (3) Whole of spermatic vein
 (4) Whole of spermatic cord
 (5) Testis and adherent scrotum

(IX) TESTICULAR SWELLING: INVESTIGATIONS**(1) Size :**

- (a) Bigger inflammation, tumour
 (b) Smaller atrophy

(2) Part of the testicle first affected :

- (a) Epididymis
 (α) Gonorrhœal inflammation
 (β) Tuberculous inflammation
 (b) Body of the testis
 (α) Syphilis
 (β) New growth
 (γ) Mumps

(3) Mode of onset and course :

- (a) Abrupt (α) Torsion
 (β) Inflammation
 (b) Insidious (α) New growth
 (β) Syphilis
 (γ) Chronic tuberculosis

- (c) Stationary or intermittent
 - (a) Inflammation
 - (β) Hæmatocele
- (d) Progressive and steady
New growth
- (4) **Softening :**
 - (a) Tuberculous abscess
 - (b) Softening gumma
 - (c) Degenerating new growth
 - (d) Associated vaginal effusion
 - (e) Atrophy testis
- (5) **Weight :**
 - (a) + + + { Hæmatocele
 - { New growth
 - (b) + + Gumma
 - (c) + Orchitis
- (6) **Bilaterality :**
 - (a) (Urethral) Ascending inflammation
 - (b) Tuberculosis late stages
 - (c) Syphilis
 - (d) Epididymal cysts vestigial
- (7) **Hydrocele**
 - (a) Acute inflammation
 - (b) Chronic small (α) Tuberculosis
 - (β) Syphilis
 - (c) Blood stained new growth
- (8) **Spermatic Cord .**
 - (a) Uniform, tender thickening
Ascending inflammation
 - (b) Beaded vas
Tuberculosis
 - (c) Irregular infiltration and thickening
New growth
- (9) **Lymph glands .**
 - (a) Lumbar
 - (b) Iliac
 - (c) Inguinal if scrotum is affected
 - (d) Supra clavicular
- (10) **Adhesions to the scrotum :**
 - (a) Anterior (α) Syphilis
 - (β) T B in anterior inversion
 - (b) Posterior tuberculosis
 - (c) Anywhere new growth
- (11) **Loss of testicular sensation :**
 - (a) Syphilis
 - (b) New growth

- (12) **Exploratory puncture :** Of vaginal fluid
 - (a) To ascertain character of fluid
 - (b) To ascertain condition of underlying testis or tumour, after evacuation of fluid
- (13) **Investigation of etiology :** P. R.
 - (a) Urethritis
 - (b) Prostatism
 - (c) Vesiculitis
 - (d) Cystitis
 - (e) Kidneys
- (14) **General examination :**
 - (a) Syphilis
 - (b) Gout
 - (c) Lungs

(A) SWELLINGS OF THE EPIDIDYMIS :

- (1) **Gonococcal epididymitis :**
 - (a) Gonorrhœal urethritis *gleet*
 - (b) Lower urinary inflammation
 - (c) Uniform thickening of vas
- (2) **Instrumentation epididymitis :**
: History of urethral *manipulations*
- (3) **Tuberculous epididymitis :**
 - (a) Nodular, craggy, *softenings*
 - (b) *Beaded vas*
 - (c) Primary prostate or vesicle
 - (d) Sometimes bilateral
- (4) **Syphilitic epididymitis :**
: (Very rare, usually affects testis)
 - (a) First year of syphilitic infection
 - (b) Small, firm, painless enlargement
 - (c) No urethritis
 - (d) Wassermann +

(B) SWELLINGS OF THE TESTICULAR BODY :

- (1) **Acute enlargements :**
 - (a) **Traumatic orchitis :** Torsion
: History and abruptness
 - (b) **Mumps orchitis :**
· Preceding or following parotitis
 - (c) **Gouty orchitis :**
 - (a) Gouty diathesis
 - (b) No urethritis
- (2) **Chronic enlargements :**
 - (a) **Diffuse syphilitic orchitis :**
 - (a) Firm, smooth, stationary enlargement
 - (b) *Loss of testicular sensation*
 - (c) Syphilitic stigmata

(b) **Gumma testis :**(1) Firm, smooth enlargement :
: *Loss of testicular sensation*↓ (2) Adhesion : *anterior*

↓ (3) Softening

↓ (4) Bursting : *wash leather slough*

↓ (5) Gummatous ulcer

↓ (6) Hernia testis

+ (7) Other stigmata

+ (8) Wassermann +

+ (9) *Therapeutic test*(3) *New growths :*

Types: (a) Teratoma

(b) Carcinoma

(c) Sarcoma

Features :

- (1) Insidious origin
- (2) Steady, **progressive**, often rapid course
- (3) Early **loss of testicular outline**
- (4) Loss of testicular sensation
- (5) **Consistency :**
: **Difference in different parts**
- (6) Signs of infiltration
- (7) **Metastases**

(X) **IMPORTANT POINTS**

- (1) Fluid from a hydrocele is yellow or straw coloured, that from a spermatocele or epididymal cyst is either colourless or milky.
- (2) *Beware of injecting pure carbolic acid or carbolic acid and glycerine into the hydrocele sac, as it gives rise to extensive sloughing of scrotum and testis.*
- (3) *After every operation upon the testis, scrotum and inguinal canal, in order to minimise the dead space, it is a good practice to support the scrotum by Nitschke's scrotal bandage.*
- (4) The only objection to injection treatment of hydrocele is that some important underlying lesion, such as malignancy, may be overlooked, *careful palpation after tapping is essential before injection.*
- (5) *In operations for hydrocele :*
 - (a) *Handle the testis gently*
 - (b) *Do not injure the vas or include it in anchor suture*
 - (c) *Do not constrict the cord*
 - (d) *Return the testis in its right plane*
 - (e) *Beware of torsion while returning.*

- (6) Cystic swellings round about the testis
 - (a) Vaginal hydrocele
 - (b) Hæmatocele
 - (c) Chylocele
 - (d) Pyocele
 - (e) Epididymal cysts
 - (α) Retention spermatocele
 - (β) Vestigial
 - (γ) Polycystic disease
 - (f) Encysted hydrocele of the cord
 - (g) Hydrocele of hernial sac
- (7) Differential diagnosis as regards testis in cystic swellings
 - (a) Vaginal effusions

Testis eclipsed
 - (b) Epididymal or cord effusions

Testis free at lower pole.
- (8) *Acute inflammatory cystic swellings in scrotum*
 - (a) *Strangulated hernia*
 - (b) *Infamed hydrocele or chylocele*
 - (c) *Recent hæmatocele*
 - (d) *Pyocele*
 - (e) *Acute epididymo orchitis*
 - (f) *Acute torsion testis*
- (9) Treatment of secondary hydrocele
 - (a) Conservative treatment
 - (b) Aspiration if required
- (10) Secondary hydrocele is always protective and so its operative treatment may lead to neuralgia testis
- (11) Incisions for hydrocele
 - (a) Scrotal
 - (α) Bad for cleansing
 - (β) Good for drainage
 - (b) Inguinal
 - (α) Good for cleansing
 - (β) Good for associated hernia
 - (γ) Bad for drainage
- (12) *Hæmatoma of the scrotum is the most common complication of hydrocele operations infection comes next in order*
- (13) *Take care of the testis in tapping a vaginal effusion, translucency test to determine the position of the testis, should always be resorted to before tapping*
- (14) General toxæmia is not so marked in pyocele or scrotal abscess
- (15) Testis reaches
 - (a) Internal abdominal ring

By 6th month of intra uterine life
 - (b) External abdominal ring

. By 8th month of intra uterine life

- (c) Scrotum :
: At or just after birth.

(16) Abnormal descent of the testis .

(A) Arrested descent .

- (a) Lumbar } : Abdominal
(b) Iliac }

(c) Inguinal.

(α) Entrant

(β) Middle

(γ) Emergent

(d) High scrotal

(B) Ectopic descent :

(α) Cruro scrotal

(b) Superficial inguinal

(c) Femoral

(d) Pre penile :

(a) Symphysis pubis

(β) Root of the penis

(e) Perineal

(f) Pelvic (abdominal).

- (17) The testis, at one time or another, comes under the influence of two hormones, the one in œstrogenic group, the influence of which is to inhibit the growth of the testis and to delay its descent, the other in gonadotropic group—a product of anterior lobe of the pituitary—the effect of which is to stimulate both the growth of the testis and its descent into the scrotum. These substances may exert their specific and apparently opposing influences at different periods, the œstrogenic group being predominant at a time when the testis is an intra-abdominal organ, the gonadotropic group being active in the last months of foetal life, so that the growth of the testis is stimulated and its descent ensured
- (18) The virtue of orchiopexy in rectifying sterility of cryptorchids warrants the performance of the operation in all suitable bilateral cases in men
- (19) *Spontaneous descent* of the testis may be expected to occur at puberty very frequently in 4 out of 5 cases of arrested descent
- (20) *Hormone therapy* increases the size of the gonads and improves the development of the scrotum, and if there is no anatomical barrier to the descent of the testis, it stimulates the natural process of testicular descent.
- (21) *The key to success in orchiopexy, is the absence of tension on the testis in its new position.*
- (22) *The treatment of arrested or ectopic testis should be operative, when diagnosed over the age of 10 years and after a waiting period of one year after hormone therapy.*

- (23) In bilateral cases of arrested or ectopic testis, the orchiopexy should be in two stages
 - (a) Lower testis orchiopexy
 - ↓ (b) Three month's interval
 - ↓ (c) Other side orchiopexy
- (24) Normal development and function of the testis are dependant upon an adequate secretion of the anterior pituitary gonadotropic hormone
- (25) Though orchiopexy is justifiable in young adults, the chance of obtaining an active testis after the age of 20 is probably small
- (26) The operation of *septal transposition* yields best results in so far as the position of the testis is concerned
- (27) If one testis is in normal position and the other is not completely descended but can be brought into the scrotum by gentle pressure fertility is not impaired and there is no demonstrable change in the individual other than a possible psychological effect from the consciousness that one organ is abnormal. If one testis is intra abdominal, the organ will undergo atrophy with consequent loss of spermatogenesis but without loss of interstitial cell function. *If both testes are undescended and intra abdominal and at least one is not brought down before the age of 8 years, atrophy of both the testes will occur* with resultant loss of development of seminiferous tubules, loss of the function of germ cells and consequent loss of fertility
- (28) *Elevation and support of the testis*
 - (a) *Relieves pain*
In acute epididymo orchitis
 - (b) *Increases pain*
In torsion testis
- (29) *Nearly all tumours of the testis are malignant*
- (30) *In all cases of acute abdomen, do not forget to examine the scrotum*
 - (a) Strangulated hernia
 - (b) Acute torsion of the testis
 - (c) Acute funiculitis and epididymo orchitis.
- (31) In the majority of instances when untwisting of a torsion has been performed after the sixth hour, atrophy of the testis ensues eventually
- (32) If a patient has lost a testicle through torsion, explore and fix the other side at some convenient time after reasonable convalescence.
- (33) Torsion of a mal-descended testis and strangulated hernia may go hand in hand, early exploration is imperative, orchidec-tomy + herniotomy are the procedures to be followed.

- (34) *Apart from orchitis of mumps, acute epididymo orchitis is of utmost rarity in young boys, whereas torsion of testicular appendages is not so uncommon in them*
- (35) If a boy gives history of scrotal swelling after a sudden attack of pain, torsion of a testicular appendage should be suspected
- (36) In true cases of trauma of the testis, there must be constitutional symptoms at the time of injury, and/or, there is local evidence of injury. Only too often, injury calls attention to a testicular swelling which has existed for some time
- (37) The commonest injury to the testis is a blow or a squeeze, the commonest result of injury to the testis is traumatic orchitis with serum or blood in tunica vaginalis
- (38) Epididymitis is secondary to prostatitis and vesiculitis extension being along the perivascular lymphatics, the chief varieties being
- Gonococcal
 - Non gonococcal coliform
 - Tuberculous
- (39) *Ascending infection of the epididymis is commonly along the perivascular lymphatics and follows infections of the posterior urethra prostate or vesicles*
- Insidiously
 - After instrumentations
 - After operations
- (40) *Discovery of chronic epididymitis always demands a thorough examination of the lower urinary and genital tracts*
- (41) Sequence of affections in epididymo orchitis
- Ascending infection
 - Epididymitis
 - Globus minor
 - ↓ (β) Globus major
 - ↓ (2) Orchitis
 - Blood infection
 - Orchitis
 - ↓ (2) Epididymitis
 - Globus major
 - ↓ (b) Globus minor
 - Trauma Orchitis
- (42) *Replacement of retracted testis by operation when carried out at the opportune time stimulates the growth of the hypoplastic testis and prevents atrophy*
- (43) *Suppuration is rare in gonococcal epididymitis but occurs commonly in mixed infections, which is sometimes mistaken for T B*
- (44) *It is unwise to jump to the conclusion that acute epididymo orchitis is necessarily gonococcal*

- (45) Unless an abscess forms, operation for acute epididymo orchitis is rarely undertaken, though decompression of epididymis is a valuable step
- (46) *Use metaphen for scrotum disinfection, as iodine irritates it*
- (47) Treatment of acute epididymo orchitis
- (A) Expectant
 - (a) Sulphonamides
 - (b) Rest + elevation + (ice \rightarrow heat)
 - (B) Operative
Decompression of the epididymis
- (48) *Calcium gluconate, 10%, 5-10 ccs intravenous on alternate days, gives good results in gonococcal epididymo orchitis*
- (49) *Calcium chloride is a strong irritant if injected extra venously, the gluconate is less objectionable in this respect*
- (50) *Most common causes of epididymo orchitis*
- (a) *Post instrumental or post operative*
 - (b) *Gonorrhœal posterior urethritis*
 - (c) *B coli urethritis*
 - (d) *Tuberculosis*
 - (e) *Traumatic*
- (51) Tuberculous epididymitis is nearly always secondary to tuberculous prostate or vesicles, infection extending along perivascular lymphatics
- (52) *Decapsulation of the epididymis is an extremely satisfactory measure in acute epididymo orchitis, whether due to gonococcus or not, convalescence is short, pain is relieved, operation is simple*
- (53) *Best treatment of tuberculous epididymo orchitis*
- (a) *Epididymectomy (orchidectomy if unilateral)*
 - (b) *Contralateral prophylactic vasectomy*
 - (c) *General anti tuberculous therapy*
 - (d) *Artificial sunlight*
- (54) *Following radical excision of the rectum, sterility occurs in nearly 100% of male cases, epididymo orchitis is frequent and can be prevented by previous vasectomy*
- (55) *Tuberculosis of epididymis begins more commonly in globus minor than in globus major, the tubercle bacillus reaches the epididymis along the lymphatics, perhaps also by way of the vas, but not often through the blood stream*
- (56) *Frequency of testicular atrophy after operation is many a times due to failure to support the testis in the immediate post operative period*
- (57) *Syphilis of the testis is comparatively less painful*
- (58) Orchitis of mumps is rare before the age of 8 and after 25
- (59) Malignant disease of the testis is not more common in the mal descended testis.

- (60) *On no account should the testis be squeezed for diagnosis of testicular tumour, for the fear of neoplastic cells being squeezed into venous or lymphatic channel*
- (61) *Seminomata are extremely radio sensitive, teratomata are radio resistant*
- (62) Average age of a patient with seminoma is 40 years and with teratoma 23 years.
- (63) *Radiograph of the lungs should in no case be omitted in suspected malignancy of the testis*
- (64) Teratoids are innocent or malignant and contain all layers of germinal cells
- Cartilaginous
 - Sarcomatous
 - Carcinomatous
 - Endotheliomatous
 - Chorion epitheliomatous
- (65) Out of the malignant teratoma of the testis, teratomatous hypoblastic carcinoma is most common and occurs between puberty and the age of 30
- (66) Indications for replacement of testis in scrotum.
- Encouragement of
 - Normal testicular development
 - Spermatogenesis
 - Lessening of the risk of trauma
 - Removal of psychic complex
- (67) Carcinoma or sarcoma may arise independently or be secondary to teratoma, which represents all layers of cells.
- (68) Secondaries in malignant testis
- Carcinoma lymphatic
 - Sarcoma blood stream
 - Teratoma
 - Lymphatic
 - Blood stream
- (69) Pathognomonic sign of epididymal cyst
Testis felt separately below the painless, elastic, globular, translucent, single or multiple swellings
- (70) *Movement with the testis is pathognomonic of any spermatic cord swelling*
- (71) If urine is free from Prolan A after operation for malignant testis prognosis is good
- (72) Pregnancy signs in male
? Testicular teratoid chorion epithelioma.
- (73) *Imperfect or mal descent of testis*
- Hormone therapy
At the age of 10
 - Watch for one year
 - Operation orchiopexy
At the age of 11 to 14

- (74) The principal indication of urgent orchidectomy is torsion testis with unsuccessful untwisting or with gangrene.
- (75) Even when damage is severe in trauma testicular repair is possible and conservatism is well repaid
- (76) Remember associated actual or potential hernia in complete descent of the testis
- (77) Imperfectly descended testis cannot be made to touch the scrotal bottom
- (78) A mobile testis retracts into superficial inguinal canal, which is superficial to external oblique aponeurosis
- (79) Most common etiological factors of malignant testis
- Trauma
 - Incomplete or mal descent
- (80) Torsion of the testis
- Strangulated hernia syndrome
 - Acute epididymo orchitis syndrome
 - Recurrent testicular crises
- (81) Every case of suspected acute abdomen examine
- Chest
 - Spine
 - Scrotum
- (82) Etiology of epididymo orchitis
- Acute
 - Gonococcal
 - B coli
 - Instrumentation
 - Tuberculosis sometimes
 - Chronic
 - Chronic gonorrhœal
 - Tuberculosis
 - Syphilis
- } Urethritis
- (83) Stop all urethral manipulations in the presence of epididymo orchitis
- (84) Differential diagnosis between tuberculosis and syphilis
- Tuberculosis

Tortuous sinus on posterior aspect
 - Syphilis

Open ulcer on anterior aspect
- (85) In every case of testicular swelling determine the site of advanced signs
- Epididymis
 - Tuberculosis
 - Ascending infection
 - Gonorrhœa
 - Instrumentation

- (b) Body of the testis
 - (a) Syphilis
 - (β) New growth
 - (86) *Any abscess on the anterior aspect of testis ? Gumma*
 - (87) Malignant testis
 - (a) Teratoma 50%
 - (b) Carcinoma 49%
 - (c) Sarcoma 1%
 - (d) Chorion epithelioma rare.
 - (88) *Chief secondaries in malignant testis*
 - (1) *Para aortic adenopathy*
 - (2) *Supra clavicular adenopathy*
 - (3) *Lungs screen or X Ray the chest*
 - (89) Cystic swellings in the scrotum with testis separate
 - (a) Encysted hydrocele of the cord
 - (b) Congenital hydrocele of funicular process
 - (c) Hydrocele of the hernial sac
 - (d) Epididymal cyst
 - (90) *Pathognomonic sign of malignant testis*
Loss of testicular outline
-

CHAPTER IX

THE PENIS AND THE SCROTUM

(A) THE PENIS

(1) CONGENITAL ABNORMALITIES:

(1) RUDIMENTARY PENIS

Path In association with pseudo-hermaphroditism

Cause Under-development

Clinic Resembles clitoris

(2) DOUBLE PENIS Rare

(3) WEBBED PENIS

Def Penile under surface attached to scrotum by a fold of skin

(4) SHORT FRÆNUM

Clinic (a) Glans curved downwards

(b) Difficult and painful coitus

Compl (a) Frænal hæmorrhage

(b) Frænal ulcer

(5) HYPOSPADIAS PENIS (See under Urethra)

(6) EPISPADIAS PENIS (See under Urethra)

(7) PSEUDO HERMAPHRODITISM

Def Resemblance to opposite sex due to development of opposite sex rudiments

Etio 95% of pseudo hermaphrodites are males

Path (A) External

Boys with under-development of external genitalia, which resemble female organs

(a) Penis clitoris like

(b) Scrotum bifid

(c) Testes retained

(d) Urethra hypospadias perinealis

(B) Internal

(a) External genitalia normal

(b) Internal genitalia of opposite sex

Clinic (a) External genitalia resembling female

(b) Male secondary sexual characters

(c) Male or female psychology

(8) PHIMOSIS

Def Difficulty in the retraction of the prepuce over the glans, due to undue narrowness of the preputial orifice

Varieties (1) Congenital:

Associated (a) Pin point external meatus

(b) Preputial adhesions

(2) **Acquired :**

- (a) Temporary : Due to inflammatory œdema
- (b) Permanent : Due to fibrosis

Clinic : Inability to uncover whole of the glans

Compl : (A) **Micturition :**

- (a) Difficult micturition
- (b) Acute retention
- (c) Chronic retention → back pressure
- (d) Incontinence' enuresis

(B) **Glans and urethra :**

- (a) Balano posthitis → Bubo
- (b) *Paraphimosis*
- (c) Calculus :
 - (α) Preputial
 - (β) Urethral
 - (γ) Vesical
- (d) Ascending infection

(C) **Genital :**

- (a) Masturbation
- (b) *Difficult coitus :*
 - (α) Multiple fissures of preputial orifice
 - (β) Paraphimosis

(D) **Straining syndrome :**

- (a) Hernia
- (b) Prolapse ani
- (c) Hæmorrhoids

(E) **Malignancy**

Treat : (A) Acute inflammatory phimosis :
: **Dorsal slit**

(B) Congenital and fibrous phimosis :
: **Circumcision**

(C) Pin-point meatus .
: **Meatotomy**

(9) **PARAPHIMOSIS :**

Def : Inability to draw the phimotic prepuce forwards over the glans, after it has been retracted behind it

Clinic : (1) Œdematous and cyanosed glans
(2) Constriction behind the glans
(3) Œdematous preputial collar :
: Behind the constriction

Compl : **Strangulation** → phagedœna

Treat : (A) **Reduction :**

(1) **Manual :**

- (a) Wrap in cotton wool with
 . Adrenaline 1% + Cocaine 10%
 For 15 minutes
- (b) Smear with vaseline
- (c) Manual reduction
- (2) **Acupuncture :**
 Multiple punctures
- (3) **Division of constriction band**
- ↓ (B) **Dorsal slit**
- ↓ (C) **Circumcision :**
 Ind After disappearance of inflammation

(II) TRAUMA :

(1) CONTUSION OF THE PENIS

- Etio Trauma during erection
- Path Extravasation of blood
 In corpora cavernosa
- Clinic Painful, tender, discoloured swelling
- Treat (a) Conservative
 Cold evaporating lotions
- (b) Aspiration

(2) FRACTURE OF THE PENIS

- Clinic (a) History of trauma during erection
- (b) Excruciating pain
- (c) Sudden distal flaccidity
- (d) Swelling
- Treat (a) Explorative incision
- ↓ (b) Turn out the clot
- ↓ (c) Repair by sutures

(3) DISLOCATION OF THE PENIS

- Def Misplacement of corpora under the skin and subcutaneous
 tissues of the pubis, due to violent drag on the penile
 skin + lateral force
- Clinic (a) Flaccid cutaneous sheath of the penis
- (b) Body of the penis felt elsewhere
- Treat Replacement

(4) LACERATION OF THE PENIS Skinning

- Etio (1) Mill accidents
- (2) *Faulty circumcision*
 Retraction of the skin after cutting
- Clinic Corpora laid bare
- Treat Skin-grafting

(5) STRANGULATION OF THE PENIS

- Etio (a) *Paraphimosis*
- (b) Constricting bands or rings
- Clinic (a) Œdematous, turgid distal portion
- (b) Deep furrow
 . With buried etiology

(2) **Acquired :**

- (a) Temporary :
: Due to inflammatory œdema
- (b) Permanent :
: Due to fibrosis

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 - (β) Urethral
 - (γ) Vesical
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- (b) *Difficult coitus* :
 - (a) Multiple fissures of preputial orifice
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Clinic (a) *Flaccid cutaneous sheath of the penis*

(b) Body of the penis felt elsewhere

Treat Replacement

(4) LACERATION OF THE PENIS *Skinning*

Etio (1) Mill accidents

(2) *Faulty circumcision*

Retraction of the skin after cutting

Clinic Corpora laid bare

Treat Skin-grafting

(5) STRANGULATION OF THE PENIS

Etio (a) Paraphimosis

(b) *Constricting bands or rings*

Clinic (a) Oedematous turgid distal portion

(b) Deep furrow

With buried etiology

- Compl: (a) Distortion
 (b) Partial flaccidity
 (c) Phagedaena
 Treat: (A) Reduction of distal turgidity
 (a) Lead lotion or adrenaline compress
 (b) Aspiration of corpora cavernosa
 ↓ (B) Sliding the foreign body down :
 : Application of a lubricant
 or (C) Nicking or dividing the etiology

(III) INFLAMMATION:

(1) BALANITIS: Balano posthitis

Def: Inflammation of the glans and mucous membrane of the prepuce

- Path. (A) *Acute* :
 (a) **Phimosis**
 (b) **Venereal** diseases
 (c) Vincent's spirochætal
 (B) *Chronic* :
 (a) Urethritis
 (b) Phimosis
 (c) **Diabetic**
 (d) **Leukoplakic**
 (e) Paget's disease
 c. (A) **Acute balanitis** :
 (a) Edematous inflamed prepuce :
 . With acute phimosis
 (b) Purulent copious discharge
 (c) Inguinal lymphadenitis
 (B) **Chronic balanitis** ;
 (a) Sanious scanty discharge
 (b) Preputial adhesions or calculi
 (c) Contraction of preputial orifice .
 : Chronic phimosis
 (d) Enlarged inguinal glands
 l (1) Acute or chronic **phimosis**
 (2) Preputial **phagedaena**
 (3) Preputial adhesions or calculi or ulcers
 (4) Lymphangitis → lymphadenitis
 t: (A) **Dorsal slit**
 ↓ (B) **Antiseptic baths**
 ↓ (C) **Circumcision** :
 Ind: Subsidence of acute inflammation
INILE LYMPHANGITIS:
 s: (a) Acute balanitis
 (b) **Venereal** lesion
 (c) **Herpes**

Clinic: Œdema and red streaks on penis

Compl. (a) Inguinal bubo
(b) Phagedæna

Treat: (a) Treat the etiology
(b) Sulphonamides

(3) PHAGEDÆNA

Def. Acute ascending gangrene of the penis

Etio. (a) **Acute balanitis**
(b) **Paraphimosis**
(c) Constriction
(d) **Extravasation of urine**
(e) **Venereal focus** chancre or chancroid
(f) **Circumcision:**
During acute inflammation
(g) Virulent infection
Anærobes

Clinic: Acute ascending gangrene

Compl. (a) *Loss of penis*
(b) Spreading gangrene
(c) Secondary hæmorrhage
(d) Septicæmia
(e) Urethral stricture

Treat (a) Hydrogen peroxide irrigations
(b) Amputation with cautery
Well clear of the lesion

After treat. Regular intermittent urethral dilatation

(IV) VENEREAL DISEASES: Of the penis

(1) SYPHILIS

(A) *Hard chancre*

Clinic (a) **Single Papule at** (1) Preputial orifice
(2) Preputial muc. mem
(3) Glans
(4) Corona glandis
(5) Meatus
(6) Penile skin
(7) Scrotal skin

(b) Rose pink hard
(c) **Indurated**, rubbery feel
(d) **Indolence:** Painless
(e) Painless, discrete lymph nodes
(f) **History of exposure:**
: More than 9 days previous

Compl. (a) Syphilitic indurative œdema
(b) Phimosis
(c) Phagedæna

(B) *Secondary lesions:*

- (a) Rashes
- (b) Warts
- (c) Condylomata

(C) *Tertiary subcutaneous gummata*

Treat: Of syphilitic lesions

(2) **SOFT CHANCRE.**

Def: Ulcers due to infection by Ducrey's bacillus, invariably caused by sexual contagion

- Clinic: (a) **Multiple**
 (b) **Very painful**
 (c) **Acute**
 (d) **No induration**
 (e) **Suppurating bubo**
 (f) **Short incubation: Within 5 days**

- Compl. (a) Suppurating inguinal bubo
 (b) Phimosis
 (c) Phagedæna

(3) **LYMPHOGRANULOMA INGUINALE:**

Def A chronic granuloma due to Leishman Donovan bodies

Clinic Red granulomatous mass situated on indurated fibrosis spreading from

Groin → penis → scrotum → perineum → anal canal

- Compl: (a) Stricture or ulcers of anal canal
 (b) Peri anal and perineal sinuses
 (c) Recto vaginal fistulæ

Diag Frei's test

Dermal test by Frei's antigen from glands of similar cases

- Diff diag (a) Malignancy
 (b) Tertiary syphilis

Treat (A) Local

- (a) Excision
- (b) Scraping
- (c) Cautery

(B) General

- Intravenous 1% tartar emetic
- One dozen injections

(V) **NEW GROWTHS:**(1) **PAPILLOMA:**

(A) **Hard:**

Clinic: Warts

Compl: Carcinoma

(B) **Soft:**

- Etio: (a) Balanitis
 (b) Venereal

(2) CARCINOMA .

- Etio : (a) Chronic balanitis
 (b) Phimosis
 (c) Leukoplakia
 (d) Venereal lesions :
 : Warts and chancroid scars
 (e) Paget's disease

- Incidence . (a) Average age 57 years
 (b) Common in Chinese
 (c) Rare in circumcised races :
 : Jews and Muslims

- Clinical types : (1) **Warty** : Infiltrating, hard or soft
 (a) Flat
 (b) **Papillary** : Fungating
 (2) **Ulcerative** : Everted, indurated, friable
 (3) **Indurative** : Induration under the prepuce
 (4) **Balanitic** : (a) Signs of balanitis
 ↓ (b) Perforation of prepuce
 ↓ (c) Fungation
 (5) **Fistulous**

- Compl : (a) **Secondary glands** :
 { (a) Inguinal
 { (β) Femoral
 (1) Inflammatory 50%
 (2) Malignant 50%
 (b) **Fungation** :
 (a) Local
 (β) Glands
 (c) **Secondary hæmorrhage** :
 (a) Dorsal vessels of the penis
 (β) External iliac or femoral artery
 (d) **Urinary complications** :
 (a) Obstruction : back pressure
 (β) Sepsis : ascending
 (γ) Fistulæ
 (e) **Urethral stricture**

- Treat : (A) **Local** :
 (1) **Partial amputation of the penis** :
 Ind . (a) Involve of less than distal half
 (b) Stump sufficient to project the
 urinary stream clear of scrotum
 (2) **Radical excision**
 (3) **Radium therapy**
 With : Suprapubic drain
 (B) **Glands** :
 (1) **Surgical excision**
 (2) **Deep X-Rays**
 (3) **Radium**

(VI) MISCELLANEOUS:**(1) PRIAPISM.**

Def Painful persistent involuntary non sexual erection

Etio (a) **Reflex irritation.** Rectum or anal canal

(b) **Post operative:** Circumcision

(c) **Thrombosis:**

(a) Traumatic

(β) Arteriosclerotic

(γ) Leukæmic

(d) **Nerve lesions:**

(a) **Traumatic:** Fracture spine

(β) Central nervous lesions

Treat (1) Sedatives + local ethyl chloride spray

(2) Aspiration → normal saline wash outs

(3) Incision → glove drain of the corpora

(4) Ligature of both dorsal arteries

(2) CHORDEE

Def Painful curved erection of penis

Etio (a) **Acute urethritis:** Gonorrhœal

(b) Corporal effusion or thrombosis

Treat (See under Priapism)

(3) HERPES

Sites (A) Ilio inguinal

(B) Glans

(C) Preputial

Clinic Row of small vesicles → ulcers

Treat Wash → Dust with bismuth formic iodide

(4) INDURATIO PENIS PLASTICA

Def Slowly developing painless induration of the penis, starting in the dependant part

Etio Age over 40 years

Path (a) Fibrous contracture?

(b) Lymphogranuloma inguinale?

Treat Pot. iodide + fibrolysin

(VII) PENILE PAIN:**(1) PAIN DURING MICTURITION**

(A) *Diseases of the urethra*

(1) **Acute urethritis**

(a) Smarting or tingling

↓ Burning or scalding

(b) Urethral discharge

(2) **Urethral calculus**

(a) History of renal or vesical calculus

(b) Sharp cutting pain

(c) Acutely obstructed urinary flow

(d) Palpation

(e) Sounding

- (3) Urethral stricture
 - (a) Gradually increasing difficulty
 - (b) Feeble stream or dribbling
 - (c) Difficult catheterisation
- (4) Urethral trauma
 - (a) Etiology
 - (α) Perineal trauma
 - (β) Fracture pelvis
 - (γ) Faulty instrumentation
 - (b) Perineal contusion
 - or (b) Urethral hæmorrhage
 - (c) Difficult micturition
 - (d) Urinary extravasation
 - (e) Difficult catheterisation
- (5) Urethral foreign body (See under (2))
 - (a) History or no history
 - (b) Local pain
 - (c) Urethral discharge
 - (d) Difficult micturition
 - (e) Palpation
 - (f) Sounding
- (B) *Diseases of the Prostate*
 - (1) Acute prostatitis and abscess
 - (a) Urinary syndrome
 - Frequency + difficulty + pain
 - (b) General toxæmia fever
 - (c) Perineal discomfort
 - (d) P R
 - (2) Prostatic carcinoma
 - (a) Prostatism syndrome
 - (b) P R fixed immovable infiltrating, indurated
 - (3) Prostatic calculus
 - (a) Prostatism syndrome
 - (b) P R. grating
 - (c) Catheterisation grating
- (C) *Diseases of the bladder*
 - (1) Acute cystitis
 - (a) Suprapubic pain
 - (b) Urinary syndrome
 - (α) Frequency
 - (β) Pus and blood in urine
 - (c) Pyrexia
 - (2) Vesical calculus
 - (a) Terminal pain
 - (b) Sounding
 - (c) X Ray
 - (d) Cystoscopy

- (3) Vesical papilloma :
 - (a) Recurrent profuse painless hæmaturia
 - (b) Cystoscope
- (4) Vesical carcinoma :
 - (a) Hæmaturia
 - (b) P. R. : infiltrating induration
 - (c) Cystoscope

(II) PAIN FOLLOWING MICTURITION . Terminal urethral pain

(A) *Diseases of the bladder :*

- (1) Vesical calculus :
 - (a) Frequency of micturition :
: Affected by work and rest
 - (b) Terminal painful hæmaturia
 - (c) Sudden stoppage of stream
 - (d) Previous history of renal colic present or absent
 - (e) Sounding
 - (f) Cystoscope
- (2) Vesical tuberculosis :
 - (a) Insidious cystitis in young adults
 - (b) Frequency of micturition :
: Independent of work and rest
 - (c) Focus in kidney, prostate or testis
 - (d) Culture
 - (e) Guinea pig inoculation
- (3) Vesical tumours :
 - (a) Elderly patients
 - (b) Frequency of micturition :
: Independent of work and rest
 - (c) Hæmaturia painless and profuse
 - (d) P. R.
 - (e) Cystoscope
 - (f) Cystogram
- (4) Acute trigonitis :
 - (a) Irritative
 - (b) Infective
 - (c) Reflex

(B) *Diseases of the ureter :*

- (1) Ureteric calculus :
 - (a) Increased frequency
 - (b) Terminal pain
 - (c) Hæmat or py-uria slight
 - (d) Renal aching and fullness
 - (e) Past history of renal colic
 - (f) P. R.
 - (g) X Rays :
 - (a) Plain
 - (β) Pyelogram
 - (h) Cystoscopy :
 - (a) Congested ureteral orifice
 - (β) Ureteral bougie

(2) Descending ureteritis

- Path (a) Tuberculous
 (b) *B coli communis*
 (c) Staphylococcal

- Clinic (a) Abnormal urine
 Bacilluria, pyuria
 (b) Frequency of micturition
 (c) Penile pain
 (d) Kidney examination
 (e) P R
 (f) X Rays pyelogram
 (g) Cystoscope
 Horse-shoe or golf hole orifice

(C) *Diseases of the prostate*

(1) Acute prostatitis and abscess

- (a) Penile pain
 (b) Perineal discomfort
 (c) Priapism
 (d) P R.

(2) Prostatic calculus Prostatic urethral

- (a) Obstructed flow
 (b) P R. tenderness
 (c) Catheter grating

(D) *Diseases of seminal vesicles*

- (a) Urinary syndrome
 (b) Genital syndrome
 (c) Rectal syndrome

(E) *Rectum and anus lesions*

- (a) Rectal carcinoma
 (b) Anal fissure
 (c) Inflamed hæmorrhoids

(III) PAIN APART FROM MICTURITION

- (1) Acute urethritis Anterior
 (2) Balanitis With or without phimosis
 (3) Chordee
 (4) Epithelioma
 (5) Herpes genitalis
 (6) Cavernitis gouty or syphilitic
 (7) Renal colic
 (8) Acute pelvic appendicitis
 (9) Neuralgia
 (10) Leukæmia
 (11) Varicocele

(VIII) PENILE ULCERS:

(1) *Simple preputial fissure*

Etiø Phimosis with friction

Site Orifice of the prepuce

Clinic: Multiple, longitudinal, painful fissures

(2) *Balanitis*:

Etio: Phimosis; diabetes, gout; venereal diseases

Age: Any

Clinic: Multiple shallow ulcers, under the œdematous and inflamed prepuce, with stinking and purulent discharge

(3) *Chancroid*

Etio. Sexual contagion

Incubation **Short** One week

Site: Glans, frænum, corona

Clinic **Multiple**, rounded or oval, punched out or sharp-edged painful ulcers with sloughy base and thin, purulent discharge.

Associated: **Suppurating inguinal bubo**

Result: **Depressed scars**

(4) *Chancre*.

Etio: Sexual contagion

Incubation: **Long**: One month

Site. Frænum, coronary sulcus

Clinic: **Single**, raised red patch with indurated margins and central ulcer with thin purulent discharge and relative painlessness

Associated: (a) **Non-suppurating, discrete, fleshy glands**

(b) Secondary syphilitic signs

(c) Wassermann or Kahn

Result **No scar; Reaction to treatment**

(5) *Epithelioma*

Etio. Chronic lesion in the aged

Site. Prepuce, glans

Clinic: **Small, raised, single, progressive ulcer** with friable, irregular, everted edges; surrounding infiltrating induration and sanious discharge

Associated Enlarged inguinal glands

Result. **Progressive ulceration and fungation**

(6) *Gummatous ulcer*

Etio: Tertiary syphilis

Site: Glans, prepuce, body of the penis

Clinic: (a) **Small elevated nodule**

↓ (b) **Ulcer with thin edge and sloughy base**

Associated: (a) Wassermann or Kahn

(b) Other syphilitic stigmata

Result: **Reaction to anti-syphilitic treatment + Pot. iodide**

(7) *Herpes progentalis*

Site. Inguinal region, glans, prepuce

Clinic Erythema → vesicles → pustules → ulcers.

(a) Linear row of multiple vesicles → ulcers

(b) Neuralgic pains

Result • Recurrence

(8) *T. B or Lupus*.

Etio. Rare

Clinic. Multiple, painful, shallow ulcers with thin overhanging edges.

(VIII) OPERATIONS ON PENIS :

Pre operate: (a) Kidney function

(b) Urinary sepsis

(c) General health

(d) Metabolic diseases

(1) CIRCUMCISION.

Ind: (a) Phimosis: (α) Congenital
(β) Acquired

(b) Pathological lesions.

(α) Ulcers

(β) Chancre

(γ) Warts

(δ) Epithelioma

(c) Social or religious

Contraind: *Acute local sepsis*

Anæsth: (1) General

(2) Sacral: 40 c.cs. of 2% novocain

(3) Regional block:

: Novocain around the penile base

(4) Local base of the prepuce

Methods. (1) Clamp method: *beuare of glans*

(2) Open method

Steps: (a) Separation of preputial adhesions

(b) Dorsal slit

(c) Cut parallel to and *at a distance* from the coronal sulcus

(d) Hæmostasis.

(α) Frænal:

: Three in one frænal stitch

(β) Dorsal vein

(γ) Dorsal arteries

(e) Sutures:

(α) Four angular anchor sutures

(β) Intervening apposing sutures

(γ) Examination of external meatus:
: Meatotomy if necessary

(g) Vaseline acriflavine dressings

Post-compl: (1) Penile skinning:

Cause: Removal of too much skin

Treat: (a) Skin grafting

(b) Suture of basal skin to preputial muc.
membrane cuff around the corona

(2) **Oedema**

(a) All round

(b) Frænal

(3) **Hæmorrhage** Frænal

(a) External soaking

(b) Hæmatoma

(4) **Priapism**

Treat (a) Sedatives bromides

(b) Ethyl chloride spray

(5) **Frænal ulcer**

(6) Scar contraction

(7) Sexual frigidity
Insensitive glans

(8) **Phagedæna**

Cause *Circumcision during acute balanitis*

(2) **PARTIAL AMPUTATION OF THE PENIS**

Ind (a) Carcinoma

(b) Phagedæna

+ (c) Prospect of leaving a stump capable of projecting the
urine clear of the scrotum

Methods (1) Flap method

(a) Long dorsal

(b) Long ventral

(2) Circular method

(3) Elliptical method

Tech (a) Cut the urethra 5 distal to corpora cavernosa

(b) Mattress sutures through the entire thickness of corpora
cavernosa

(a) Two horizontal } (Med Ann 1938)
(β) Four vertical }

(c) Split the urethral end and suture the halves to the skin

Post. treat (1) Tie in catheter

(2) Vaseline dressings

(3) **TOTAL AMPUTATION OF THE PENIS**

Ind Carcinoma penis

Contraind (a) Kidney inefficiency

(b) Local inoperability

(c) Low general condition

Anæsth (1) General

(2) Spinal

Tech (1) Lithotomy posit on

With bougie in the urethra

(2) Incision

(a) Basal circle

↓ (b) Median scrotal

↓ (c) Transverse perineal

- (3) Exposure of bulb and crura.
: Division of bulbo and ischio cavernosi
- (4) Isolation of bulb
- (5) Cutting the urethra.
: 1.5" distal to the bulb
- (6) Ligation of vessels
. Of the bulb and crura
- (7) Separation and cutting of the crura
- (8) Division of dorsal vein
- (9) Separation and removal of the penis
- (10) Suture of the urethra
: To the perineal skin
- (11) Suture of the incision.
• With adequate drainage

- Addl steps • (12) Removal of testes and scrotum
or (12) Removal of scrotum + orchioplasty into thighs
+ (13) Bilateral removal of inguinal glands
Method (a) Along with primary operation
(b) As a second stage
Incisions (a) Lateral extensions from basal circle
or (b) Vertical inguinal (Med Ann 1939)
Points. Save (a) Femoral vein
(b) Femoral artery
(c) Femoral nerve

- Post. compl: (1) Shock
(2) Hæmorrhage
(3) Anuria → uræmia
(4) Ascending urinary sepsis
(5) Cellulitis or gangrene of the wound
(6) Delirium nervosum
(7) Chest complications
(8) Heart complications

- Sequelæ. (a) Retraction and stricture of urethral orifice
(b) Glandular recurrence
(c) Secondary hæmorrhage.
From femoral vessels
(d) Œdema of the legs

(4) OPERATION FOR IMPOTENCE

- Plication of perineal muscles by fascia lata
(a) Bulbo-cavernosus
(b) Ischio-cavernosi

(B) THE SCROTUM

(1) CONGENITAL ABNORMALITIES:

(1) BIFID SCROTUM

- Associated: (a) Hypospadias perinealis
(b) Incomplete descent of the testes
Clinic: Pseudo hermaphroditism

(2) SCROTAL DERMOID

- Clinic Midline pilo sebaceous cyst
 Compl Infection
 Diff diag (a) Sebaceous cysts
 (b) Scrotal abscess
 Treat Excision

(II) TRAUMA

(1) CONTUSION

In association with contusion of testes

- Etio Squeezes and falls

(2) LACERATION Avulsion

- Etio (a) Mill accidents
 (b) Bull gore
 Compl (a) Prolapse testis
 ↓ (b) Hernia testis
 Treat (a) Debridement
 ↓ (b) Plastic operation
 (a) Skin grafting
 or (β) Orchidopexy

(3) HÆMATOMA

- Etio Post operative
 (a) Herniotomy
 (b) Hydrocele excision of the tunica
 Clinic Swelling within 48 hours after operation
 Compl (a) Sepsis
 (b) Fibrosis
 Treat (A) Preventive
 (a) Good hæmostasis
 (b) Tight bandage + elevation
 (a) Place over a leucoplast bridge
 or (β) Suture scrotum to pubis
 (B) Curative
 (a) Conservative + iodide
 (b) Syringe out the clot
 (See under Tunica Vaginalis)
 (c) Incise and turn out the clot

(III) INFECTION

(1) SCROTAL ECZEMA

- Etio (a) Friction Large scrotal swellings
 (b) Urinary irritation
 (a) Dribbling
 (β) Large scrotal swelling
 (γ) Buried or short penis
 Treat (a) Treat the etiology

- (b) Protection of scrotal skin :
: Vaseline or boric ointment
- (c) Treat the eczema

(2) SCROTAL ERYSIPELAS:

Etio: Contagion from:

- (a) Other parts
- (b) Other patients

Path: Streptococcal cutaneous lymphangitis with pronounced general toxæmia

- Clinic: (1) Acute and rapidly spreading, red, inflammatory, œdematous swelling of the scrotal skin with raised borders and vesication
- (2) Local itching + smarting + tenderness
 - (3) Regional lymphadenitis?
 - (4) Severe constitutional signs

Diff. diag: (a) Eczema or intertrigo scrotum
(b) Cellulitis scrotum

Compl: (a) Cellulitis scrotum
(b) Gangrene scrotum
(c) Septicæmia

Treat: (1) **Sulphonamides**
(2) Anti-streptococcal serum
(3) Local ichthyol ointment

(3) SCROTAL CELLULITIS:

Etio: (a) **Extravasation of urine:**
(a) Rupture bulbous urethra
(β) Rupture peri urethral abscess
(b) **Filariasis:** Streptococcal
(c) Local septic focus: boil

Clinic: (1) Acutely spreading, œdematous, inflammatory swelling
(2) Septic toxæmia

Special: (a) Extravasation of urine:
(a) *Non entrance into thighs*
(β) Abrupt perineal limitation
(γ) Abdominal subcutaneous ascent
(b) **Filariasis:** other filarial stigmata
(a) Elephantiasis
(β) Inguinal lymphadenitis

Compl: (1) **Gangrene scrotum**
(2) **Septicæmia**

Treat: (A) **Local:**

- (a) Fomentations: hip baths
- ↓ (b) Free incisions
- ↓ (c) Hypertonic: baths, irrigations, packs

- (B) **General** Ant septic
Sulphonamides antistreptococcal
- (C) **Causal**
Treat the etiology

(4) IDIOPATHIC SCROTAL GANGRENE

- Syn Fournier's gangrene
- Clinic (a) Progressively spreading gangrene
↓ (b) Exposure of testes
Which are not affected
- Treat (a) Incisions cauterisation excision
(b) Irrigations (α) Hydrogen peroxide
(β) Pot permanganate
(c) General ant septics
Sulphonamides
(d) Specific
Anti gas gangrene serum

(IV) SPECIFIC INFECTIONS

(1) TUBERCULOSIS

- Etio Tuberculous epididymitis
- Path (a) Tubercle formation
↓ (b) Fibrosis
↓ (c) Caseation
↓ (d) Secondary infection
↓ (e) Sinus formation
- Clinic (a) Cold abscess or discharging sinus
(α) Postero inferior angle
(β) Anterior
In anterior inversion of epididymis
(b) Adherent epididymis
Nodular craggy
- Treat (a) Scraping
(b) Excision
Epididymis with sinus track or orchidectomy

(2) SYPHILIS

- (A) **Chancre**
- (B) **Secondary condylomata**
- (C) **Gumma testis**
(a) Enlarged testis
↓ (b) Adherent testis
Anterior aspect
↓ (c) Gummatous abscess
↓ (d) Gummatous ulcer
(α) Anterior aspect
(β) Round
(γ) Punched out sharp margins
(δ) Wash left or slough
(e) Adherent testis

Treatment: (a) Pot. iodide
(b) Anti syphilitic

(3) FILARIASIS:

Syn: **Elephantiasis scrotum** (See page 1857)

Etio: (a) *Filariasis*

(b) Sloughed or excised lymph glands

Path: Indurative fibrous hypertrophy of skin and subcutaneous tissues of the scrotum and penis

Clinic: (A) **Passive type:**

: Slow induration

(B) **Lymphatic type:**

: Soft, vascular, cedematous

(C) **Inflammatory type:**

: Recurrent cellulitis with fever

Associated: (1) **Elephantiasis elsewhere:**

: Leg, penis, hand

(2) **Filarial lymphatic abscess:** inguinal

(3) **Filarial chylocele**

Compl: (a) **Distortion** of penis

(b) **Enormous swelling**

(c) **Recurrent cellulitis**

(d) **Eczema or irritation** skin

Treat: (a) **Excision** of the skin and subcutaneous tissues of the scrotum and penis

+ (b) **Orchidopexy:**

: Inner sides of the thighs

+ (c) **Penis:**

(a) **Skin-graft**

or (β) Cover it with preputial muc. membrane

(V) SCROTAL CYSTS:

(1) SEBACEOUS CYST.

Clinic: (a) **Subdermal**

(b) **Multiple**

(c) **Scattered. anywhere**

(d) **Adherent** to skin at one black spot

(e) **Sebaceous material**

Compl: **Infection**

Treat: **Excision**

(2) DERMOID:

Clinic: (a) **Subcutaneous**

(b) **Non adherent** to skin

(c) **Single**

(d) **Midline**

(e) **Sebaceous material + hair**

(VI) SCROTAL NEW GROWTHS:

(1) PAPILLOMATA:

(a) **Warts**

(b) **Condylomata**

(IX) SCROTAL CYSTIC SWELLINGS:**(A) Skin and subcutaneous tissues****(1) Abscess:**

Path (a) Primary

(b) Secondary pointing abscess

Chnrc Inflammation + fluctuation + fever

(2) Sebaceous cyst: (See page 1855)

(a) Multiple

(b) Scattered

(c) Non inflammatory

(d) Tense, globular, mouldable

(e) Adherent to skin

: At one black spot

(3) Dermoid (See page 1855)

(a) Single

(b) Midline

(c) Non adherent to skin

(d) Sebaceous material + hair

(B) Underlying cystic swellings**(a) Recent hæmatoma****(b) Tunica vaginalis:**

(1) Hydrocele

(2) Recent hæmatocele

(3) Chylocele

(4) Pyocele

(c) Epididymis:

(1) Cysts

(2) Cold abscess

(d) Testis: Fluctuating gumma**(e) Spermatic cord:**

(1) Encysted hydrocele

(2) Hydrocele of hernial sac

(X) SOLID SCROTAL TUMOURS:**(1) Secondary syphilis:****(A) Papules:**

(a) Flat dusky papule

(b) Fine desquamation of skin

(B) Mucous patches:

(a) Moist surface

(b) Milk white appearance

(c) Other signs of syphilis

(2) Prurigo:

(a) Small, firm, red papule

(b) Pigmented skin

(c) Intolerable itching

(3) **Epithelioma :**

- (a) Chronic warty growth
- (b) Infiltration and induration
- (c) Progressive lesion
- (d) Inguinal secondaries
- (e) Occupation
- (f) Age: past 40

(4) **Lipoma :**

- (a) Multilobular
- (b) Soft
- (c) Well defined edges, slipping under the finger
- (d) Mobile
- (e) Subcutaneous
- (f) Along the cord

XI) ULCERS OF THE SCROTUM:

- (1) **Soft chancre :** (See page 1842)
- (2) **Hard chancre :** (See page 1841)
- (3) **Epithelioma :** (See above)
 - (a) Chronic
 - (b) Slow but steady progress
 - (c) Induration
 - (d) Infiltration
 - (e) Eversion
 - (f) Friability
 - (g) Inguinal secondaries
- (4) **Gummatous :** (See page 1854)
 - (a) Anterior aspect
 - (b) Round, punched out
 - (c) Wash leather slough
 - (d) Protruding or adherent testis
- (5) **Tuberculous :** (See page 1854)
 - (a) Posterior aspect
 - (b) Sinus with fibrosis around
 - (c) Adherent craggy epididymis
 - (d) Caseous discharge
- (6) **Fungating malignancy :**
 - : Irregular, protruding mass of testis

(C) IMPORTANT POINTS

- (1) 95% of pseudo hermaphrodites are males.
- (2) *Every case of phimosis, look for :*
 - (a) *Preputial adhesions*
 - (b) *Pin point meatus*
 - (c) *Hernia*
 - (d) *Prolapse ani.*

- (3) Infections in different lesions
 - (a) Hard chancre *Treponema pallidum*
 - (b) Soft chancre *Ducrey bacillus*
 - (c) Granuloma *Leishman Donovan*
- (4) In a case of priapism, do not forget to examine the spleen for leukæmic enlargement
- (5) If erection has persisted for two days, thrombosis exists in the corpora and the use of sedatives, narcotics, hypnotics and cooling lotions are absolutely useless
- (6) In carcinoma penis, radium for primary and surgical excision for the secondary glands.
- (7) When a circumcision wound in an adult does not heal within a reasonable time, the lesion should be regarded as potentially malignant and treated accordingly
- (8) *The chief post operative complication of amputation penis is stricture urethra*
- (9) *In circumcision*
 - (a) *Do not remove too much or too less skin*
 - (b) *Beware of preputial adhesions to glans*
 - (c) *Keep a collar of muc mem around the corona glandis*
 - (d) *Secure good hæmostasis*
 - (α) Three in one fraenal stitch
 - (β) Dorsal vein
 - (γ) Dorsal arteries
 - (e) *Secure good mucocutaneous apposition*
- (10) *In circumcision*
 - (a) *Never perform it in presence of acute sepsis*
 - (b) *Open method is better than clamp method*
- (11) *Most common complications of phimosis*
 - (a) *Balanitis*
 - (b) *Paraphimosis*
 - (c) *Urinary obstruction*
 - (d) *Urinary calculus*
 - (e) *Strain syndrome*
- (12) *Never do hernia or prolapse rectum in the presence of phimosis*
- (13) Paraphimosis is common in
 - (a) Children
 - (b) First coitus.
- (14) Chief indications for circumcision
 - (a) Custom
 - (b) Child within 2 weeks
 - (c) Presence of complications
 - (d) Marriage
 - (e) Any preputial focus
 - (f) Hasty ejaculation

- (15) Chordee or priapism is common in :
 (a) Gonorrhœal urethritis
 (b) Nervous diseases
 (c) Thrombosis
 (d) Post operative.
- (16) *Do not forget to give sedatives after circumcision.*
- (17) *Treatment of balanitis is dorsal slit with hypertonic bath.*
- (18) *Common ulcers on penis :*
 (a) *Hard chancre : induration*
 (b) *Soft chancre : multiple*
 (c) *Carcinomatous*
- (19) *Most common etiological factor of cancer penis is phimosis.*
- (20) Clinical varieties of carcinoma penis :
 (a) Warty
 (b) Ulcerous
 (c) Fistulous
 (d) Balanitic.
- (21) *Causes of death in carcinoma penis :*
 (a) *Anuria with uræmia*
 (b) *Urinary sepsis*
 (c) *Secondary hæmorrhage :*
 : Femoral artery or vein
- (22) Amputation penis :
 (a) Good stump possible :
 : Partial amputation
 (b) Too short stump :
 : Total amputation
- (23) *Most common post operative complications after amputation penis are :*
 (a) *Hæmorrhage*
 (b) *Anuria*
 (c) *Urinary sepsis*
 (d) *Wound sepsis*
 (e) *Stricture urethra*
 (f) *Decubitus*
- (24) *There is never any incontinence in complete amputation penis.*
- (25) *Gangrenous patch on the glans penis is inevitably an harbinger of death.*
- (26) Vertical incisions for removal of inguinal glands have three advantages :
 (a) Excellent exposure
 (b) Parallel to vessels
 (c) No pocketing.
- (27) *Johnson's three vertical incisions radical operation for carcinoma penis.*

(Med. Ann. 1939)

(Med. Ann. 1939)

- (28) *In a young patient in whom increased frequency, pyuria and penile pain are present, a search should be made for any tuberculous focus especially in testis, prostate, vesicles or kidneys and T B bacilli in urine.*
- (29) *Sequelæ of different lesions*
 (a) *Hard chancre. no scar*
 (b) *Soft chancre. depressed scar*
 (c) *Gummatous ulcer pigmented, thin, ill nourished scar*
- (30) *Most common growths of the scrotum.*
 (a) *Condylomata*
 (b) *Sebaceous cysts*
- (31) *Most common scrotal inflammation urine extravasation*
- (32) *Penile shaft and testis are entirely unaffected in elephantiasis of the scrotum*
- (33) *Any scrotal abscess on the anterior aspect. suspect a gumma*
- (34) *Posterior sinus, fibrosis or adhesion to epididymis is most commonly due to tuberculosis*
- (35) *Hæmatoma of the scrotum is the most common post operative complication after operations on inguinal or scrotal regions*
- (36) *A stitch uniting the scrotal bottom to mons pubis at the end of an inguinal or scrotal operation, is a good prophylactic against post operative scrotal hæmatoma*
-

THE ENDOCRINES

CHAPTER I

THE PITUITARY

(1) ANATOMY.

Site (a) Suspended at the base of the brain, from the floor of the third ventricle, by the infundibulum

(b) Lies in the pituitary fossa of the sella turcica of the sphenoid bone, in the middle fossa of the skull

Dimensions. 13 mm × 8 mm.

Structure (A) Anterior lobe:

Embryo · From ectodermal pharyngeal pouch

Parts: (a) *Pars anterior*

Histology · Cord like alveoli of granular cells:

(α) Chromophobe.

· Cause hypopituitarism

(β) Chromophil:

(1) Eosinophil ·

: Cause hyperpituitarism

(2) Basophil ·

: Cause Cushing's syndrome

(b) *Intra glandular cleft*:

· Remnant of the Rathke's pouch

(c) *Pars intermedia*:

Histology · Granular basophil cells:

: With colloid material

(B) Posterior lobe *Pars nervosa*

Embryology · From neural ectoderm

Histology · Neuroglial cells and fibres

(C) *Pars Tuberalis*:

Embryo: From oral ectoderm

Histology · Surrounds the infundibulum

: Very vascular

Relations: (A) Inferior:

: Sphenoidal air sinuses

(B) Lateral.

(a) Cavernous sinuses: right and left

with: (α) Nerves:

: 3rd, 4th, 5th, 6th

(β) Internal carotid artery

(b) Intercavernous sinuses: ant. and post.

(C) Superior

(a) Diaphragma sellæ

(b) Optic chiasma and tract

(c) Floor of the third ventricle

(d) Clinoid processes

(2) **PHYSIOLOGY**Functions (A) *Pars anterior*

- (a) Skeletal growth
- (b) Sexual development
- (c) Mental development

(B) *Pars intermedia*

- (a) Metabolism
 - (α) Metabolic rate
 - (β) Glycosuria
 - (γ) Deposition of fat
- (b) Regulation of urine
- (c) Stimulation of plant muscle
- (d) (Regulation of melanophores in frogs)

(C) *Pars nervosa*Vehicle of *pars intermedia*(3) **PATHOLOGY** *Dyspituitarism*(1) **Anterior lobe over activity**

Cause

Path

Clinic

- (b) **Acromegaly** After epiphyseal union

(2) **Anterior lobe deficiency**

Cause (a) Chromophobe hyperplasia

- (b) Anterior lobe necrosis

- (c) Suprasellar tumours

Path Anterior hypopituitarism

Clinic (a) **Infantilism**

- (α) Delay in genital maturity

- (β) Delay in secondary sex characters

- (b) **Simmonds syndrome**

(3) **Posterior lobe deficiency**

Cause (a) Chromophobe hyperplasia

- (b) Suprasellar tumours

Clinic (a) **Obesity**

- (b) Increased sugar tolerance

(4) **Combined antero posterior lobe deficiency**

Cause Suprasellar tumours

Clinic **Froehlich syndrome**(4) **CLINIC**(1) *Hyperpituitarism*

Cause Eosinophil hyperplasia

Types (A) **Gigantism**

Etio Hyperpituitarism before epiphyseal union

Types (a) Pituitary acidophilism

Late spurt of growth

- (b) Pituitary basophilism

Syn Cushing's syndrome

(B) Acromegaly :

Etiology. Hyperpituitarism after epiphyseal union

Path: (1) Abnormal sensitiveness to stresses

↓ (2) Symmetrical osseous hypertrophy

+ (3) Connective tissue hyperplasia

Clinic: (a) Skeletal changes. '*Gorilla type*'

(1) Lower jaw: prognathous

(2) Hands & feet. large and coarse

(3) Spine: kyphosis

(b) Connective tissue hyperplasia:

: Coarse face

(c) Increased sexual excitement,

(d) Glycosuria:

: Relieved by insulin

(e) Profuse perspiration

(f) ...

(g) ...

Clinic: (a) Dwarfism

(b) Infantilism:

(a) Skeletal

(β) Sexual

(c) Sexual depression

(d) Adiposity

(e) Depression of metabolic rate

(f) Cutaneous changes:

(a) Alopecia

(β) Wrinkling

(g) Mental backwardness

Syndrome: (A) **Simmond's syndrome :**

Cause: Anterior lobe deficiency

Clinic: (a) Hypogonadism

(b) Alopecia

(c) Anorexia + achlorhydria

(d) *Cachexia* + *anæmia*(B) **Frohlich's syndrome :**

Syn. ...

Path:

Clinic:

plastic genitals

(a) *Sex infantilism*(b) *Obesity*

(c) Lowered metabolism

(d) Increased sugar tolerance

(e) Local and general pressure signs

(C) **Lorain's syndrome .**

Clinic: (a) Attractive graceful children

(b) *Appearance of childhood in adult life*

(2) PHYSIOLOGYFunctions (A) *Pars anterior*

- (a) Skeletal growth
- (b) Sexual development
- (c) Mental development

(B) *Pars intermedia*

- (a) Metabolism
 - (α) Metabolic rate
 - (β) Glycosuria
 - (γ) Deposition of fat
- (b) Regulation of urine
- (c) Stimulation of plain muscle
- (d) (Regulation of melanophores in frogs)

(C) *Pars nervosa*Vehicle of *pars intermedia***(3) PATHOLOGY Dyspituitarism**(1) **Anterior lobe over activity**

Cause ~

Path ~

Clinic (

- (a) ~
- (b) **Acromegaly** After epiphysial union

(2) **Anterior lobe deficiency**

- Cause (a) Chromophobe hyperplasia
- (b) Anterior lobe necrosis
- (c) Suprasellar tumours

Path Anterior hypopituitarism

Clinic (a)

Infantilism

- (α) Delay in genital maturity
- (β) Delay in secondary sex characters
- (b) **Simmonds syndrome**

(3) **Posterior lobe deficiency**

- Cause (a) Chromophobe hyperplasia
- (b) Suprasellar tumours

Clinic (a)

Obesity

- (b) Increased sugar tolerance

(4) **Combined antero posterior lobe deficiency**

Cause Suprasellar tumours

Clinic

Frohlich syndrome**(4) CLINIC**(1) *Hyperpituitarism*

Cause Eosinophil hyperplasia

Types (A)

Gigantism

Etio Hyperpituitarism before epiphysial union

Types (a)

Pituitary acidophilism

Late spurt of growth

- (b) **Pituitary basophilism**

Syn **Cushing's syndrome**

(B) Acromegaly :

Etio : Hyperpituitarism after epiphysial union

Path : (1) Abnormal sensitiveness to stresses

↓ (2) Symmetrical osseous hypertrophy

+ (3) " " " " " "

Clinic : (a) " " " " " "

" " " " " "

(2) Hands & feet : large and coarse

(3) Spine : kyphosis

(b) Connective tissue hyperplasia :

: Coarse face

(c) Increased sexual excitement

(d) Glycosuria :

: Relieved by insulin

(e) Profuse perspiration

(2) Hypo pituitarism :

Cause : (a) Chromophobe hyperplasia

(b) Suprasellar tumours

Clinic : (a) Dwarfism

(b) Infantilism :

(a) Skeletal

(β) Sexual

(c) Sexual depression

(d) Adiposity

(e) Depression of metabolic rate

(f) Cutaneous changes :

(a) Alopecia

(β) Wrinkling

(g) Mental backwardness

Syndrome : (A) Simmond's syndrome :

Cause : Anterior lobe deficiency

Clinic : (a) Hypogonadism

(b) Alopecia

(c) Anorexia + achlorhydria

(d) *Cachexia* + anæmia

(B) Frohlich's syndrome :

Syn. : *Dystrophia adiposo genitalis*

Path : Disturbance of all functions of pituitary

Clinic : Stunted, fat, idiotic children with hypoplastic genitals.

(a) *Sex infantilism*

(b) *Obesity*

(c) Lowered metabolism

(d) Increased sugar tolerance

(e) Local and general pressure signs

(C) Lorain's syndrome .

Clinic : (a) Attractive graceful children

(b) *Appearance of childhood in adult life*

(2) **PHYSIOLOGY**Functions (A) **Pars anterior**

- (a) Skeletal growth
- (b) Sexual development
- (c) Mental development

(B) **Pars intermedia**

- (a) Metabolism
 - (α) Metabolic rate
 - (β) Glycosuria
 - (γ) Deposition of fat
- (b) Regulation of urine
- (c) Stimulation of plain muscle
- (d) (Regulation of melanophores in frogs)

(C) **Pars nervosa**

Vehicle of pars intermedia

(3) **PATHOLOGY** **Dyspituitarism**(1) **Anterior lobe over activity :**

Cause

Path

Clinic

- (b) **Acromegaly :** After epiphysial union

(2) **Anterior lobe deficiency :**

Cause (a) Chromophobe hyperplasia

(b) Anterior lobe necrosis

(c) Suprasellar tumours

Path Anterior hypopituitarism

Clinic (a) **Infantilism**

(α) Delay in genital maturity

(β) Delay in secondary sex characters

(b) **Simmond's syndrome**(3) **Posterior lobe deficiency :**

Cause (a) Chromophobe hyperplasia

(b) Suprasellar tumours

Clinic (a) **Obesity**

(b) Increased sugar tolerance

(4) **Combined antero posterior lobe deficiency :**

Cause Suprasellar tumours

Clinic **Frohlich syndrome**(4) **CLINIC**(1) **Hyperpituitarism**

Cause Eosinophil hyperplasia

Types (A) **Gigantism**

Etio Hyperpituitarism before epiphysial union

Types (a) Pituitary acidophilism

Late spurt of growth

(b) Pituitary basophilism

Syn Cushing's syndrome

(B) Acromegaly :

Etio	Hyperpituitarism after epiphyseal union
Path	(1) Abnormal sensitiveness to stresses
↓	(2) Symmetrical osseous hypertrophy
+	(3) Connective tissue hyperplasia
Clinic	(a) Skeletal changes ' <i>Gorilla type</i> '
	(1) Lower jaw prognathous
	(2) Hands & feet large and coarse
	(3) Spine kyphosis
	(b) Connective tissue hyperplasia
	Coarse face
	(c) Increased sexual excitement
	(d) Glycosuria
	Relieved by insulin
	(e) Profuse perspiration

(2) Hypopituitarism

Cause	(a) Chromophobe hyperplasia
	(b) Suprasellar tumours
Clinic	(a) Dwarfism
	(b) Infantilism
	(α) Skeletal
	(β) Sexual
	(c) Sexual depression
	(d) Adiposity
	(e) Depression of metabolic rate
	(f) Cutaneous changes
	(α) Alopecia
	(β) Wrinkling
	(g) Mental backwardness

Syndrome. (A) Simmond's syndrome :

Cause	Anterior lobe deficiency
Clinic	(a) Hypogonadism
	(b) Alopecia
	(c) Anorexia + achlorhydria
	(d) <i>Cachexia</i> + anæmia

(B) Frohlich's syndrome :

Syn.	Dystrophia adiposo genitalis
Path	Disturbance of all functions of pituitary
Clinic	Stunted, fat idiotic children with hypoplastic genitals
	(a) <i>Sex infantilism</i>
	(b) <i>Obesity</i>
	(c) Lowered metabolism
	(d) Increased sugar tolerance
	(e) Local and general pressure signs

(C) Lorain's syndrome

Clinic	(a) Attractive graceful children
	(b) <i>Appearance of childhood in adult life</i>

- (α) Diminished growth
- (β) Sex infantilism
- (γ) Fine hairless skin
- (D) Brissaud's syndrome
- Clinic (a) Obesity chubby face
- (b) Somnolence
- (c) Defective growth of hair
- (E) Oppenheim's syndrome
- Syn *Pseudo-tabes pituitaria*
- Clinic Subacute degeneration of the cord
- Path Defective anterior lobe

(5) TUMOURS :

: *Classification of pituitary tumours*

(A) *Intra sellar tumours*

(1) *Adenomata .*

(A) **Chromophobe adenomata :**

Etio Commonest

Age . 20 to 40

Clinic Hypopituitarism

(B) **Chromophil adenomata :**

Age . After 30

Types . (a) **Eosinophil adenoma**

Clinic Hyperpituitarism

(b) **Basophil adenoma :**

Clinic : Cushing's syndrome

(C) **Mixed or transitional adenomata :**

Age 20 to 40

Clinic Hyper + hypo pituitarism

(2) *Adeno carcinomata :*

Age . After 45

Path . (a) Primary chromophobes

(b) Secondaries liver

Clinic . (a) Primary infiltration signs

(b) Enlarged liver

(3) *Cranio pharyngiomata*

(B) *Supra sellar tumours*

(1) *Cranio pharyngiomata*

Syn : Adamantinomata

Age : 10-20 years

Path : Slow cysts

Origin : Rathke's pouch

Clinic : (a) Pressure signs :

(a) Local

(β) General intracranial

(b) Hypopituitarism

(2) *Endotheliomata*

(3) *Basal meningiomata*

(4) *Aneurysm*

Clinical syndrome of pituitary tumours :

(A) Constitutional : Dyspituitarism

(1) Hyper pituitarism

(2) Hypo pituitarism

(3) Mixed

(B) Pressure syndrome :

(a) Local pressure :

(a) Visual changes :

(1) Optic chiasma :

: Bitemporal hemianopia

(2) Optic nerve

: Unilateral blindness

(3) Optic tract :

: Homonymous hemianopia

(4) Oculomotor :

: Diplopia and palsy

(5) Cavernous sinus :

: Proptosis with engorged lids

(β) Brain changes :

(1) Anterior temporal lobe :

: Uncinate fits of smell

(2) Foramen of Monro :

: Hydrocephalus

(3) Floor of the third ventricle :

: Persistent drowsiness

(4) Frontal lobes :

: Slow cerebration

(γ) Basal syndrome :

(1) Diabetes insipidus

(2) Glycosuria

(3) Obesity

(4) Somnolence

(5) Hyperthermia

(δ) Changes in sella turcica :

(1) Deep ballooning

(2) Clinoid erosion

(b) General intra-cranial tension :

(1) Headache

(2) Vomiting

(3) Papilloedema → optic neuritis

(4) Irritability → slow cerebration

(5) Bradycardia

(6) Subnormal temperature

(I) ADENOMATA

(1) Chromophobe adenoma •

Etiology Commonest pituitary growth

Age Between 20 and 40

Clinic (A) *Local pressure group*

(a) Visual signs

(1) Choked disc

(2) Optic atrophy

(3) Bitemporal hemianopia

(b) Large sella turcica

(c) Raised intra cranial pressure

(B) *Hypopituitarism*(a) *Infantile type*

(1) Local pressure signs

(2) Sexual infantilism

(3) Skeletal infantilism

(4) Adiposity

(5) Feminine configuration

(b) *Adult type*(a) *Adiposo genital*

Etiology Most common

Age 20 to 60

Sex Equal

Clinic (1) Local pressure signs

(2) Headache & somnolence

(3) Adiposity

(4) Sexual depression

With female configuration

(5) Low metabolism

With high sugar tolerance

(b) *Atrophic*

Clinic (1) Local pressure signs

(2) Senile configuration

(2) Chromophil adenoma

(A) Eosinophil adenoma :

Age After 30

Types (1) Before puberty

Gigantism

(2) After puberty

Acromegaly (See page 1867)

Clinic (a) Skeletal overgrowth

(1) Prominent jaw

(2) Large nose

(3) Spade hands and feet

(4) Hyperostosis

(5) Kyphosis

(b) Moderate dermal hyperplasia

(c) Sexual excitement → depression

(d) Late local pressure signs

(B) Basophil adenoma :

Syn : Pituitary basophilism

Path. (a) Basophil adenoma

+ (b) Cortico adrenal hyperplasia

Clinic : *Cushing's syndrome* :

(a) Premature sexual maturity

(b) Rapidly developing obesity :

• Face, neck and trunk

(c) Hypertrichosis :

Trunk, face and limbs

(d) Dry dusky skin

(e) Vascular hypertension

(f) Glycosuria and hyperglycaemia

(3) Mixed adenoma .

Age : 20 to 30

Clinic . Mixed hyper- and hypo pituitarism

(II) ADENOCARCINOMATA .

Age : After 45 years

Path : (a) Chromophobe cells in irregular groups

(b) Very vascular

(c) Cystic degeneration

(d) Local infiltrative destruction

(e) Metastases in liver

Clinic : Rapid local and general pressure syndrome

(III) SUPRA-SELLAR CYSTS :

Syn : (1) Cranio pharyngiomata

(2) Adamantinomata

Age : Between 10 and 20 years

Frequency : 5% of all pituitary tumours

Path : Congenital cystic tumours :

: From embryonic rests of Rathke's pouch

Morb anat: (a) Unilocular

or (b) Multilocular

+ (c) Contents.

(a) Fluid

(β) Calcified areas

(γ) Papillomas

Course: Slow cysts with gradual pressure on :

(a) Optic chiasma

(b) Infundibulum

(c) Third ventricle

Clinic : *Frohlich's syndrome* :

(a) Childhood

(b) Pressure signs :

- (a) Local syndrome
 - (1) Failing vision
 - (2) Headache
 - (3) Somnolence → drowsiness
- (β) Brain changes (See page 1869)
- (γ) Basal syndrome (See page 1869)
- (δ) X Ray
 - (1) Sellar deformity
Clinoid erosion
 - (2) Flocculent calcification
- ↓ (ν) General intracranial tension +
- ↓ (c) Hypo pituitarism
 - (α) Adiposity
 - (β) Sexual infantilism
 - (γ) Metabolic changes
 - (1) Diabetes insipidus
 - (2) Low basal metabolism
 - (3) High sugar tolerance

Differential Diagnosis between pituitary tumours

<i>Adenoma</i>	<i>Adamantinoma</i>
Age Above 20	Age Below 20
Early dyspituitarism	Late dyspituitarism
Late cranial s gns	Early cranial signs
Sellar ballooning	Clinoid erosion
No calcification	Supra sellar calcification
No polyuria	Early polyuria
Late visual s gns	Early visual signs

Diagnose a pituitary tumour from

- (a) Basal meningioma
- (b) Optic glioma
- (c) Cerebellar tumours
 - (α) Medullo blastoma
 - (β) Ependymal tumour

Treatment of pituitary tumours

(I) Operative

- Ind (1) Progressive impairment of vision
- (2) Intolerable headache

Tech (1) Radical operation

Routes (A) Trans sphenoidal

- Ind (a) Adenomata
- (b) Intra-sellar tumours
- (c) Inferior tumours

Position Prone

Anæsth Ether by pharyngeal tube

- Steps (a) Upper alveolo-labial fold incision
 (b) Submucous resection of septum & Vomer
 (c) Introduction of bivalve speculum
 (d) Nibbling of
 (α) Anterior wall of sphenoidal cells
 ↓ (β) Floor of the sella
 (e) Scooping of the tumour

After treat Nasal plug for 24 hours

(B) Trans-frontal:

Ind Supra-sellar tumours

Position Supine

- Steps (a) Frontal bone flap
 (b) Tap the ventricle through dura
 If the pressure is high
 (c) Retraction of dura from the bone
 (d) Incision of the dura
 Along the sphenoidal ridge
 (e) Retraction of frontal lobe
 (f) Tapping of the cyst
 (g) Delicate dissection of cyst wall
 (h) Replacement of bone flap
 (i) Closure
- Save (a) Optic nerve
 (b) Optic chiasma
 (c) Ant. branch of int. carotid art.

(C) Trans temporal

- Ind (a) Supra-sellar tumours
 (b) Palliative decompression

(2) *Palliative decompression*

- Tech (a) Subtemporal
 In supra-sellar growths
 (b) Sellar
 In intra-sellar growths

- Ind (a) Failing vision
 (b) Intolerable headache
 + (c) Inoperable tumour
 (α) Completely
 (β) Partially

(II) Deep X Ray therapy

- Time (a) Pre-operative
 (b) Post-operative
 (c) Palliative

- Routes (1) Temporal
 (2) Frontal

IMPORTANT POINTS

- (1) After the gliomas, pituitary tumours form the next largest group of intra cranial new growths.
- (2) *Anatomy and physiology :*
 - (a) Pars anterior . from Rathke's pouch
 - (b) Pars intermedius . from Rathke's pouch
 - (c) Pars posterior or nervosa . from brain
 - (d) Pars tuberalis : from Rathke's pouch
 - (a) *Pars anterior .*
 - (α) *Skeletal growth*
 - (β) *Sexual development*
 - (γ) *Mental development*
 - (b) *Pars intermedius + pars nervosa :*
 - (α) *Regulation of metabolism :*
 - (1) *Metabolic rate*
 - (2) *Glycosuria*
 - (3) *Deposition of fat*
 - (β) *Regulation of urine flow :*
: *Diabetes insipidus*
 - (γ) *Stimulation of plain muscles .*
: *Arterioles and uterus*
 - (δ) *Regulation of melanophores.*
- (3) *Pathology :*
 - (A) *Hyperpituitarism*
 - (a) *In children . gigantism*
 - (b) *In adults . acromegaly*
 - (B) *Hypopituitarism :*
 - (a) *In children :*
 - (α) *Infantilism :*
 - (1) *Skeletal*
 - (2) *Sexual*
 - (β) *Obesity*
 - (b) *In adults :*
 - (α) *Sex depression*
 - (β) *Obesity*
 - (γ) *High carbohydrate tolerance*
 - (C) *Additional signs of pituitary disorder :*
 - (a) *Diabetes insipidus*
 - (b) *Obesity.*
- (4) *Growths of the pituitary :*
 - (A) *Intra sellar growths :*
 - (a) *Chromophil adenoma :*
 - (1) *Eosinophil adenoma :*
: *Hyperpituitarism*
 - (2) *Basophil adenoma :*
: *Cushing's syndrome*

- (b) *Chromophobe adenoma*
Hypo pituitarism
- (c) *Mixed or transitional adenoma*
Hyper + hypo pituitarism
- (B) *Supra sellar cysts*
Hypo pituitarism
- (5) Growth defects are present in all cases of pituitarism in children
- (6) *Tumours of the pituitary are of three kinds*
 - (A) *Inferior*
Epistaxis and post nasal discharge
 - (B) *Lateral*
Cavernous sinus pressure syndrome
 - (C) *Superior*
Optic chiasma and basal syndrome
- (7) *Tumours of the pituitary are of two kinds*
 - (A) *Dys pituitarism* → *pressure effects*
Intra sellar growths
 - (B) *Pressure effects* → *dys pituitarism*
Supra sellar growths
- (8) Pituitary tropic hormones
 - (a) Thyrotropic
 - (b) Gonadotropic
 - (c) Growth hormone
 - (d) Diabetogenic
- (9) Growth endocrine regulation (including reproductive functions) and metabolism form the functional trinity of anterior pituitary lobe
- (10) Whether an intra sellar pituitary tumour produces visual symptoms or not depends in a large degree on the size of the foramen in the diaphragma sellæ for infundibulum, if it is large tumour bulges up and causes early visual changes, if it is small, the tumour bulges down through the floor of the sella.
- (11) *50% of pituitary tumours give rise to visual signs*
- (12) *Compact classification of pituitary tumours*
 - (A) *Intra sellar tumours*
 - (1) *Adenomata*
 - (a) *Chromophobe*
Etio Commonest
Age 20-40
Clinic Hypo pituitarism
 - (b) *Chromophil*
Age After 30
Types (a) *Eosinophil*
Hyper pituitarism

(β) *Basophil*

Cushing's syndrome

(c) *Mixed or transitional*

Age 20-40

Clinic Hyper + hypo pituitarism

(2) *Adeno-carcinomata*

Age After 45

Path (a) Chromophobe

(b) Liver metastases

Clinic (a) Primary signs

(b) Enlarged liver

(B) *Supra sellar tumours cranio pharyngioma*

Syn Adamantinoma

Age 10-20 years

Origin Rathke's pouch

Path Slow cyst

Clinic (a) Pressure syndrome

(α) Local

(β) General intracranial

(b) Hypo-pituitarism

(13) *Clinical syndrome of pituitary tumours*(1) *Dys pituitarism*(A) *Hyper pituitarism*(B) *Hypo pituitarism*(C) *Basophilism*

(a) Hyper pituitarism

+ (b) Cortico adrenal syndrome

(2) *Pressure syndrome*(A) *Local*

(a) Visual

(b) Cranial nerves

(c) Cavernous sinus

(d) Brain cortex

(B) *General intracranial*(14) *Tumour groups of pituitary*(1) *Hyper pituitarism*

Eosinophil adenomata

(2) *Hypo pituitarism*

(a) Chromophobe adenomata

(b) Supra sellar tumours

(3) *Pituitary basophilism*

Basophil adenomata.

(15) *In hypo pituitarism children fail to reach sex adolescence, adults lose sexual desire and potency*(16) *Supra sellar congenital cysts are extremely rare above the age of 20 and give rise to irregular deformation of sella. Adenomata are rare below 20 and give rise to symmetrical sellar enlargement.*

- (17) Operation of choice for pituitary adenomas is by way of the trans sphenoidal approach
 - (18) Modern approach to supra sellar pituitary tumours is right sided trans frontal extra dural, usual procedure is incision of capsule and aspiration of contents
 - (19) *Flocculent areas of calcification are pathognomonic of supra sellar cysts*
 - (20) Clinical stages of pituitary tumours
 - (a) Endocrine
 - (b) Visual
 - (c) Tumoral
 - (21) Hypo pituitarism in children
 - (a) Growth defects
Infantile skeleton
 - (b) Bone development
Retardation of ossification
 - (c) Sexual infantilism
 - (d) Mentality
Bright and alert
 - (e) Neighbourhood pressure syndrome
 - (22) Chromophobe adenoma is the commonest type of pituitary tumours and gives rise to hypo pituitarism
 - (23) Hyper pituitarism is always associated with eosinophil adenoma of the anterior lobe and gives rise to gigantism in children and acromegaly in adults
 - (24) *Different syndrome in pituitary disease*
 - (1) *Froehlich's syndrome*
Stunted fat, idiotic children with hypoplastic genitals
 - (2) *Lorain's syndrome*
 - (a) Attractive graceful children
 - (b) Childish adults
 - (3) *Brissaud's syndrome*
Somnolent obese children
 - (4) *Oppenheim's syndrome*
Subacute degeneration of the cord
 - (5) *Simmond's syndrome*
Infantilism + anorexia + cachexia
 - (6) *Cushing's syndrome*
 - (a) Premature sexual maturity
 - (b) Hyper trichosis
 - (c) Obesity
 - (d) Vascular hypertension
 - (e) Diabetes
 - (25) In all, except late cases, amelioration of vision relief of head ache and improvement in mentality follow surgical procedures in pituitary tumours.
-

CHAPTER II

THE THYROID

(I) ANATOMY

Gross Two lateral lobes united by isthmus

Lying against upper trachea

(a) Arteries

- (1) Superior thyroid upper pole
 In relation to external laryngeal nerve
- (2) Inferior thyroid middle of post. surface
 In relation to recurrent laryngeal nerve
- (3) Thyroidea ima
- (4) Accessory thyroids

(b) Veins

- (1) Superior thyroid } → Int. jug. vein
- (2) Middle thyroid }
- (3) Inferior thyroid → Left innominate vein
- (4) Accessory thyroid

(c) Nerves in relation

- (1) Recurrent laryngeal vocal cords
- (2) External laryngeal cricothyroid
- (3) Superior laryngeal inter arytenoids

(d) Capsules

- (1) True glandular
- (2) False pre tracheal fascial

Histology Lobules of spherical or oval vesicles lined by granular cubical or low columnar cells and occupied by iodine-containing colloid *thyroxin*, which is absorbed by lymphatics or blood stream

(A) Resting or storage phase

Excessive accumulation of colloid with flat cells

(B) Active or secretory phase

Diminution or absence of colloid with cubical cells

(II) PHYSIOLOGY

Control Thyrotropic hormone of ant. pituitary

Secretion Thyroxine di-iodo-tyrosine 65% iodine
 . Average total amount is 5.6 mgm. of iodine

Functions (1) Regulation of metabolic level
 (2) Catalysation of body oxidations
 (3) Neutralisation of toxins

(III) PATHOLOGY: *Varieties of goitre*

- (1) Cretinoid goitre
- (2) Physiological goitre
- (3) Colloid or involutional goitre :
 (a) Diffuse involutional

- (b) **Nodular involutional:**
 - (a) **Diffuse nodular**
 - (β) **Local nodular:**
: Colloid adenoma
- (4) **Toxic goitre: *Thyrotoxicosis***
 - (A) **Primary toxic**
 - (B) **Secondary toxic:**
 - (a) **Early**
 - (b) **Late**
 - (C) **Complicating thyrotoxicosis**
- (5) **New growths:**
 - (A) **Benign:**
 - (a) **Fœtal adenoma**
 - (b) **Papilloma**
 - (B) **Malignant:**
 - (a) **Carcinoma:**
 - (a) **Papilliferous adeno carcinoma**
 - (β) **Malignant adenoma:**
 - (1) **Metastasising**
 - (2) **Proliferating**
 - (r) **Scirrhus**
 - (b) **Sarcoma**

(IV) CLINIC:

- (1) **Bilateral or unilateral pyramidal tumor:**
Characters: (a) Symmetrical or asymmetrical
 (b) Cystic or solid
 (c) **Moving on deglutition**
Situation: (a) Low down in the neck
 (b) Both sides of midline
 (c) Both sides of trachea
- (2) **Pressure syndrome:**
 - (a) Veins
 - (b) Nerves
 - (c) Trachea
 - (d) Œsophagus: rare
- (3) **Dys-thyroidism syndrome:**
 - (a) Hypo thyroidism
 - (b) Thyrotoxicosis

(V) CONGENITAL ABNORMALITIES:

(1) LINGUAL THYROID.

Site: Foramen cæcum at the base of the tongue

Time: Puberty

Clinic: Purple red globular swelling

Compl: (a) Hæmorrhage

(b) Degeneration

(c) Carcinoma

Treat: Leave alone

(2) THYRO GLOSSAL CYSTS AND SINUSES

Site	Foramen cæcum to supra sternal notch
Types	(A) <i>Thyro glossal cyst</i>
Time	Childhood or adolescence
Site	Midline, infra hyoid
Morb nat	(a) Columnar epithelial lining (b) Clear glairy or mucoid fluid contents
Compl	(a) Inflammation ↓ (b) Suppuration ↓ (c) Fistula Median cervical
	(B) <i>Thyro glossal fistula</i>
Etio	(a) Suppurated thyro glossal cyst (b) Partial excision of thyro glossal cyst
Clinic	(a) Median cervical fistula (a) Supra hyoid (β) Infra hyoid (b) Glairy or purulent discharge (c) Fibrosis and contracture around
Treat	Complete excision of the whole tract

(3) ABERRANT THYROID

Sites	(a) Along thyro glossal tract (b) In lines with the poles lateral side neck (c) Mediastinum—(between trachea & œsophagus)
Compl	(a) Athyrosis After excision (b) Papilliferous carcinoma (c) Difficult diagnosis
Diff diag	(a) Enlarged lymph gland (b) Branchial cyst

(VI) INFLAMMATION

(1) **Acute thyroiditis**

Etio Acute infectious fevers

(2) **Chronic thyroiditis**

Types	(A) Tuberculous (a) Miliary (β) Caseous (γ) Sclerosing (B) Syphilitic
Etio	Congenital or acquired
Path	Diffuse fibrosis
Clinic	Hard, adherent moderately enlarged

(3) **Ligneous thyroiditis**

Syn	(a) Woody thyroiditis (b) Riedel's thyroiditis (c) Iron struma
-----	--

Etio Usually occurs in *young adults of both sexes*

Path : (a) Hyperplasia \rightarrow diffuse fibrosis + degeneration
(b) Adhesions to surrounding structures :
: Infra-hyoid and sternomastoid muscles

Clinic: Painless, stony hard, asymmetrical swelling :
 (a) Adherent to surroundings
 (b) Pressure syndrome:
 : No recurrent laryngeal paralysis

Diff. diag: (a) Malignant thyroid
(b) Actinomycosis
(c) Lymphadenoid goitre. (Hashimoto's disease)
(See below)

Treat: (a) Partial resection (Hemi thyroidectomy)
(b) Radium

(4) **Lymphadenoid Goitre :**

Syn: Hashimoto's disease

Etiology: Usually affects women about 40 or so

Path. Generalised symmetrical enlargement

: Soft, painless, no pressure symptoms

: Non infiltrating, no adhesions to surrounding structures

: No lymph node enlargement

: Sooner or later ends in myxœdema, because of destruction of gland by lymphocytes and fibrosis

Macroscopic: Homogeneous, yellowish white gland, no vesicles

Microscopic: Diffuse infiltration with lymphocytes, even forming
at places germ centres or lymph follicles
: No hyperplasia of thyroid tissue

Clinic: Like diffuse colloid goitre but enlargement moderate.
: May be signs of hypo thyroidism
: Radio sensitive

Diagnosis . Suspicion : (from above)
: Confirmed by Biopsy

Treatment: Nil

: Thyroid extract by mouth.

: When symptoms of hypo-thyroidism supervene

(VII) **GOITRE**: Enlargement of the thyroid

(A) CRETINOID GOITRE:

Syn: Compensatory goitre

Clinic: Goutre in cretins of average height

(B) PHYSIOLOGICAL GOITRE

Syn: Hypertrophic goitre

Def: Temporary functional enlargement of the thyroid due to increased mental and physical demands on it.

Etiology. Mental and physical crises :

Path Reaction to a physiological stimulus, of a gland deficient in iodine

Morb anat (1) Columnar epithelial proliferation
(2) Diminution of colloid

Clinic	(a) Small, symmetrical, soft enlargement
	(b) No pressure signs or symptoms
	(c) Occasional slight thyrotoxicosis

Treat (a) Remove septic foci
(b) Thyroid extract: 1 gr B D
(c) Lugol's iodine 5 m in milk B D

Compl (1) Colloid or involutonal goitre
(2) Thyrotoxicosis

(C) INVOLUTIONAL OR COLLOID GOITRE

Def Enlargement of thyroid due to
: Hyper-involution following hyperplasia

Types (1) Diffuse involutonal goitre
(2) Nodular involutonal goitre :
(a) Local nodular : Colloid adenoma
Single nodule
(b) Diffuse nodular . Pudding goitre
Studded multiple nodules

Etio (A) Endemic hilly and marshy districts
(B) Sporadic

Theories

- (1) Kocher earth and water
- (2) McCarrison toxic infection
- (3) **Iodine deficiency :**
Deficiency of iodine and vitamin A
- (4) **Faulty intake :** Excess of
 - (a) Proteins, *fats and calcium*
 - (b) Cytrogen compounds cabbages
 - (c) Goitrogenous substances.
Calcium, boron, silica, organic acids
- (5) Bad hygienic surroundings

Path (A) ~ 1000

(c) Colloid accumulation

(B) *Nodular involutonal*

Morb anat Circumscribed areas of involution *
Developed in a hyperplastic gland

Types (a) Colloid type.
(α) Colloid flat celled vesicles
↓ (β) Necrosis or hæmor or calcific.

(b) **Fœtal type :**

: Small cubical celled vesicles ; cells packed in columns , ill developed acini with small thin colloid.

(c) **Intervening areas of hyperplasia****Clinic (A) *Diffuse involutinal***(1) **Hard, nodular, irregular goitre**(2) **Pressure syndrome :**

(a) Veins thorax, neck and face
Duskiness, dilatation, varicosity

(b) Trachea scabbard
. Respiratory difficulty

(c) Recurrent laryngeal nerve

(a) Brassy cough

(β) Altered voice

(3) **Mild hypo-thyroidism : Myxædema****(B) *Nodular involutinal***(1) **Circumscribed nodules .**

Single or multiple

In normal or hypertrophied thyroid

(2) **Pressure syndrome :**

(a) *Trachea* In retro sternal goitre

(b) Veins

(c) Nerves

Compl. (1) *Hæmorrhage into the cyst***Clinic (a) **Severe dyspnœa** and stridor**

(b) Dilated superficial thoracic veins

(c) Thickening of the skin of the face

(d) Sleeping posture

(e) **Sudden increase in size**

Compl **Sudden respiratory crisis :**

In retro sternal goitres

(2) ***Thyrotoxicosis***

. Early and late secondary

Treat . (1) **Conservative**

(a) Removal of septic foci tonsils

(b) Thyroid extract 1 gr B D

(c) Lugol's iodine

(2) **Operative**

Ind Deformity, pressure, thyrotoxicosis

Oper . (A) *Diffuse involutinal****Partial thyroidectomy :***

(a) Ant. $\frac{2}{3}$ ds of each lobe

(b) Isthmus

(c) Retro-sternal extension

- (B) Nodular involutonal
 - (a) Enucleation
 - (b) Resection-enucleation
 - (a) Unilateral
 - (β) Bilateral

(D) TOXIC GOITRE THYROTOXICOSIS

Etio Nervy females at adolescence or climacteric

- Age**
- (a) Primary toxic
 - (α) Adolescence 18-35 years
 - (β) Any time in life acute crisis
 - (b) Early secondary toxic
 - Adults twenties
 - (c) Late secondary toxic
 - Climacteric
 - (d) Rare before puberty and after 50

- Pred sp**
- (1) Emotional strain + nervous instability
 - (2) Endocrine disturbances
 - Thyrotropic hormone of pituitary
 - (3) Infection Acute or chronic tonsillitis
 - (4) Heredity + X factor
 - (5) Other forms of goitre

- Path factors**
- (1) Intensity of stimulation
 - Excessive gradual
 - (2) State of thyroid epithelium
 - (A) Primary toxic
 - Response of the epith of whole gland
 - (B) Secondary toxic
 - Response of epith of involuted gland
 - (a) Early secondary
 - From early colloid thyroid
 - (b) Late secondary
 - From advanced colloid thyroid
 - (C) Complicating thyrotoxicosis
 - Secondary toxic syndrome supervening on simple goitre or new growth
 - (3) Age and condition of body tissues
 - Sensitivity heart musculature

- Morb anat**
- (1) Columnar hyperplasia and hypertrophy
 - (a) Uniform and diffuse
 - In primary
 - (b) Scattered areas in colloid thyroid
 - In secondary
 - (2) Lymphocytic aggregation
 - (3) Disappearance of colloid
 - Crenated margins and vacuoles
 - (4) ++ vascularity

- Clinic • (1) Onset**
 (A) Primary
 Insidious or abrupt at adolescence
 (B) Early secondary
 Goitre precedes toxicosis by a few years
 (C) Late secondary
 Goitre precedes heart syndrome by many years
- (2) First signs .**
 (a) Fatigue and *loss of weight*
 or (b) *Palpitations*
 or (c) Tremors or *nervousness*
 or (d) Exophthalmos
 or (e) Goitre
- (3) Goitre**
 (A) Primary toxicosis
 Smooth or coarse, bilateral, symmetrical, vascular (pulsatile or bruit)
 (B) Early secondary toxicosis
 Irregular, larger, bilateral
 (C) Late secondary toxicosis
 Nodular or *cystic*
- (4) Exophthalmos • Primary toxicosis**
 Etio (a) Present in primary toxicosis
 (b) Variable in early secondary
 (c) Absent in late secondary
 Path (a) Contraction of Muller muscle
 (b) Venous engorgement
 (c) Deposition of fat
 (d) Lymphatic obstruction
- Clinic** (a) Von Graefe lagging of upper eyelid
 (b) Stellwag slow winking
 (c) Dalrymple wide palpebral interval
 (d) Mobius weak convergence
 (e) Joffroy smooth forehead
 (f) *Staring look*
- (5) Nervous syndrome :**
 Sympathetic sensitisation
 (a) Nervousness, irritability, neurasthenia
 (b) *Fine tremors* tongue & hands
- (6) Cardio-vascular • Late secondary toxicosis**
 (a) *Tachycardia*
 (b) Extra systole
 (c) Auricular flutter or fibrillation
 (d) Heart failure
- (7) Metabolic syndrome**
 (a) Rise in metabolic rate
 (b) Voracious appetite

- (c) *Loss of weight* → *emaciation*
- (d) *Diarrhoea*
- (e) *Glycosuria*
- (f) *Flushing and sweating*

- (8) **Course** Intermittent
- Crises**
- (a) Rapid pulse
 - (b) Persistent restlessness
 - (c) Mental symptoms
 - (d) *Cachexia*
 - (e) *Pyrexia* (may be *Hyperpyrexia*)

Variations in secondary toxicosis syndrome

- (1) *Gout* marked and precedes toxicosis
- (2) *Exophthalmos* absent
- (3) *Cardiovascular signs* prominent

- Compl
- (1) **Thyrotoxicosis crises**
 - (2) **Heart failure**
 - (a) *Toxemic*
 - (b) *Congestive*
 - (c) *Embolie*
 - (3) **Severe mental disturbances**
 - (4) **Extreme emaciation**
 - (5) **Glycosuria** *Diabetes*
 - (6) **Skin complications**
 - (7) **Pruritus**
 - (8) **Coma**

Clinic *Bulbar paralysis* affecting
Speech + deglutition + asthenia

- Treat
- (a) *Glucose* 20-30 c.c. of 25% T D S
 - (b) *Adrenaline* 3-4 ampoules
 - (c) *Lugol's iodine* 10 m T D S.
 - (d) *Prolan* 200 units a day

- Diff diag
- (1) **Nervous diseases**
Neurasthenia hysteria
 - (2) **Cardiovascular diseases**
Heart disease
 - (3) **Phthisis or diabetes**

- Treat (A) **Conservative**
- (a) *Remove septic foci*
No operation before thyroid is tackled
 - (b) *Mental and physical rest*
Give *bromides* *luminal* etc. if necessary
Removal to *quiet surroundings*
Sympathetic attitude assurance
Lugol's iodine
High carbohydrate diet esp *glucose*

(B) Operative (See under Operations)

- Ind (a) Sequelæ of the disease
 (b) Economic factor
- Tech (1) **Ligature of thyroid arteries**
 (a) Superior thyroid
 (b) Inferior thyroid
- (2) **Partial thyroidectomy**
 7/8th of each lobe
 (in one or more stages)

(C) Palliative

- (1) Injection of boiling water
 5 to 20 c cs after novocainisation
- (2) Radiation
- Ind (a) Preliminary to operation
 (b) Post operative recurrence
- Compl (a) Telangiectasis
 (b) Aggravation of toxicity
 (c) Burns of the skin
 (d) Cachexia strumipriva
 (e) Wide adhesions

(E) NEW GROWTHS OF THE THYROID**(1) FOETAL ADENOMA**

- Path Proliferation of follicular epithelium
 (a) Anastomosing columns or cords of cells
 (b) Circular follicles or tubules lined by cells
 (c) Transitional forms
- Clinic (a) Single round, encapsuled, local tumor
 (b) Deformity
 (c) Pressure syndrome
 Respiratory difficulty
- Compl (a) **Malignancy**
 (b) **Hæmorrhage** → pressure syndrome
 Especially in intra thoracic
 (c) **Thyrototoxicosis**
 (d) **Cyst formation**
 (e) Calcification

(2) PAPILLOMA

- Path Active papilliferous growth
- Clinic Encapsuled local tumour
- Compl (a) Malignancy
 (b) Cyst formation

(3) CARCINOMA THYROID

- Etio Women between 40 and 60
- Precanc (1) Aberrant thyroid
 (2) Adenomatous cyst nodular goitre
 (3) Thyroid adenoma or papilloma

- Types (A) Papilliferous adeno-carcinoma :**
 Etio Aberrant thyroids
 Path Papillary growths into cystic spaces
 Clinic Slow growth
Secondaries in local lymph glands
- (B) Malignant adenoma**
 Etio (a) Most common
 (b) Secondary to foetal adenoma
 Path *Secondaries by blood stream .*
 (a) **Bones**
 (b) **Lungs**
- Types (a) Metastasising adenoma . Slow**
(b) Proliferating adenoma Rapid
- (C) Scirrhus, spheroidal or medullary .**
 Spread (a) Local infiltration
 (b) Lymph permeation
- (D) Epidermoid or squamous**
- Clinic (A) Local syndrome**
 Goitre with some abnormality
(B) Distant syndrome
Bone lesion in seniles
- (1) Pre existing goitre :**
 With (a) **Local syndrome**
 (1) Localised irregularity
 (2) Localised induration
 (3) *Increase in size*
 (4) *Rapidity of growth*
 (b) **Infiltration syndrome**
 (1) *Overstepping the capsule*
 (2) *Incorporation of neighbours*
- (2) Regional syndrome**
 (a) **Trachea**
 (a) *Respiratory embarrassment*
 (β) *Respiratory complications*
 (b) **Veins**
Œdema, duskiness, varicosity
 (c) **Nerves**
 (a) *Altered voice + brassy cough*
 (β) *Neuralgias*
 (d) **Oesophagus dysphagia**
- (3) Metastatic syndrome**
 (a) **Lymph enlarged lymph nodes**
 (b) **Blood Bones and lungs**
Vertebrae, skull, long bones
Large, soft, pulsating tumours
- (4) Endocrine syndrome .**
, Thyrotoxicosis

- Diff diag (1) Hæmorrhage in adenoma
 (2) Woody thyroiditis
 (3) Calcified nodule
 (4) Carcinoma trachea
- Treat (A) **Excision** → **deep x ray therapy**.
 Excision of thyroid en bloc after ligation of all the vessels and excision of a portion of the int jugular vein on the side of greater infiltration. The lymph nodes should also be excised en bloc if and when present
- (B) **Radium** Collar or bomb
- Death (1) Pressure syndrome respiratory
 (2) Respiratory catarrh
 (3) Hæmorrhage

(4) SARCOMA THYROID

(VIII) HYPO THYROIDISM

(1) CRETINISM

Def **Congenital hypo thyroidism**

Due to atrophy or defective secretion

Eti (a) Sporadic

(b) Endemic

Path (a) Degenerated epithelium

(b) Scanty colloid

(c) Fibrosis

(d) Hyperplasia in cretinoid goitre

Clinic Various milestones in the course of the child's development are reached much later than normal

(A) **Non goitrous cretins**(a) **Mental deficiency** Idiocy(b) **Facial expression**

Puffy bloated face with big tongue

(c) **Growth retardation** Dwarfism

(d) Sexual retardation

(e) Protuberant abdomen

(f) Skin dry, atrophic senile

(g) Constipation

(B) **Goitrous cretins**

(a) Signs less marked

+ (b) Goitre

Treat (1) Thyroid medication

Thyroid extract 1 gr B D

(2) Thyroid implantation

(2) MYXŒDEMA

Def **Acquired hypo thyroidism** Due to
 , Pathological or surgical deprivation of thyroid

- Types: (A) Idiopathic
 (B) Pathologic : Colloid goitre
 (C) Post operative : Cachexia strumipriva

Etiol: Females of 40-45

- Clinic: (a) Mental dullness
 (b) Sleepy, unintelligent face
 (c) Decreased metabolism : Obesity
 (d) Decreased sexuality
 (e) Skin and subcutaneous tissues :
 (a) Dry + rough + hairless
 (β) Supra clavicular fatty pads

- Treat (1) **Thyroid medication :**
 (a) Thyroid extract
 (b) Thyroxine
 (2) **Thyroid implantation : (Personal case)**
 Good result with goat's thyroid

(IX) OPERATIONS ON THYROID ·

(1) THYROID ADENOMA :

- Ind (1) Failure of medicinal treatment
 (2) Deformity
 (3) Steady increase in size
 (4) Dyspnoea :
 (a) Chronic and gradual
 (b) Sudden crisis :
 (a) Retro-sternal goitre
 (β) Hæmorrhage into a cyst
 (5) Pressure upon blood vessels
 (6) Pressure upon recurrent nerve :
 · Altered voice or dysphagia
 (7) Toxic syndrome
 (8) Pain
 (9) Fear of malignancy

- Operation: (1) Single small adenoma :
 · Enucleation
 (2) Single very large adenoma :
 · Hemi thyroidectomy
 (3) Multiple small scattered :
 · Wedge resection : (Resection-enucleation)

Prep · Lugol's iodine

- Anæsth: (a) Open or intra tracheal ether
 (b) Local novocain

- Oper. tech · (A) Enucleation :
 (a) Kocher's collar incision
 (b) Division of platysma
 (c) Vertical separation of pre-tracheal muscles

- (d) Division of fibrous sheath
- (e) Incision in thyroid tissue
Till glistening capsule is seen
- (f) Enucleate the adenoma
- (g) Obliterate the cavity
By buried sutures
- (h) Drainage for 24 hours
- Ind (α) Large adenoma
- (β) Toxic syndrome

(B) Hemi thyroidectomy

- (1) Exposure of the thyroid
- (2) Forward dislocation of the lobe
- (3) Division of
 - (α) Middle thyroid vein
 - (β) Superior thyroid vessels
 - (γ) Inf thyroid vein
- (4) Excise the thyroid tissue
Leave back a thin slice posteriorly
- (5) Division of branches of inf thyroid artery
- (6) Division at the isthmus
- (7) Obliterating sutures
- (8) Drain for 24 hours

(2) COLLOID GOITRE

Ind (1) Dyspnoea

- (a) Causing discomfort
- (b) Steadily progressive
- (c) Interference with sleep
- (d) Sudden severe crisis

(2) Multiple adenomata

- (a) Failure of conservatism
- + (b) Pressure syndrome

(3) Hyper thyroidism

(4) Deformity

Operation (A) Double wedge resection

- (a) Exposure of the thyroid
- (b) Dislocation of both lobes
- (c) Division of isthmus
- (d) Application of clamps in two rows
- (e) Wedge resection between clamps
- (f) Obliteration sutures
- (g) Drain for 24 hours

(B) Thyroid decompression

Ind Sudden grave respiratory crisis

Hæmorrhage in retro-sternal goitre

Steps (1) Collar incision

- (2) Division of pre tracheal muscles
- (3) Division of pre tracheal fascia
- (4) Forward dislocation of thyroid
- (5) Extrusion or resection

- After treat (a) Morphia
 (b) Fluids
 (c) Rectal
 Lugol + saline + glucose

(C) Cyst-aspiration

Ind Sudden grave respiratory crisis

(3) THYROTOXICOSIS

Contraind (a) Very early stage first 6 months

(b) Crisis especially nervous

Ind (a) Sequelæ

(b) Economic factor

(c) Failure of conservatism

Prep (1) Removal of septic foci

(2) Rest in bed for 3 weeks

(3) Low diet

(4) Hydrotherapy 3000—4000 c cs per day

Oral, rectal, subcutaneous

(5) Lugol's iodine for 3 weeks

(6) Treat the heart digitalis

(7) Treat the diabetes

(8) Sedatives and mental assurance

Bromides chloral hydras, luminal

Anæsth (A) Local novocain + open ether

(B) Rectal olive oil + ether

(C) Intra tracheal ether, N₂O + O₂ or cyclopropane

Operations (A) Ligature of sup or inf. thyroid art.

Ind (a) Preliminary in severe cases

(b) Mild cases

(May be done under local even in patient's bed)

(B) Subtotal thyroidectomy

Def Removal of all but a thin posterior slice of each lobe

Steps (1) Wide collar incision

(2) Skin platysma flap retraction

(3) Sternomastoid retraction

(4) Division of ant. jugular veins

(5) Division or separation of pre tracheals

Transverse cut at upper with middle thirds

(6) Treatment of the lobes

(a) Ligation and division of

(α) Superior thyroid vessels

(β) Middle and inf thyroid veins

(γ) Inf. thyroid artery

(b) Excision of the lobe

Leaving behind a button of thyroid tissue

(7) Treatment of isthmus

(8) Re-suture of pre-tracheal muscles

(9) Drainage

(α) 24 hours

(β) Till temperature is normal

- After treat (a) Morphia
 (b) Rectal 4 hourly
 Saline + glucose + Lugol 30 min
 Bromides
 (c) Rest in bed for 3 weeks
 Then gradually up to normal enviro ents

Post. compl (1) Post operative crisis

- Treat (a) Oxygen inhalations
 (b) Ice packs temp above 104
 (c) Lugol's iodine
 (α) By mouth 10 min T D S
 (β) By rectum 30 min
 (γ) Intravenous 20-40 min
 Diluted in saline
 (d) Saline + glucose + Lugol
 Continuous intravenous
 (e) Insertion of a drain
 (f) Morphia

(2) Mechanical dyspnoea

- Causes (a) Hæmorrhage
 (b) Recurrent laryngeal trauma
 (c) Tracheal collapse
 Treat (1) *Prophylactic suture of trachea to muscles*
 During the thyroidectomy
 (2) Sitting posture + flexion head
 (3) Oxygen tent
 (4) Intubation larynx
 (5) Tracheotomy

(3) Parathyroid tetany (See under Parathyroids)

- Treat (a) Intravenous
 Calcium gluconate 10% 10 c cs
 (b) Oral
 Calcium lactate 2 teaspoonfuls every hour
 (c) Parathormone intravenous

(4) Heart failure

Treat Morphia and digitalis

(5) Reactionary hæmorrhage

- Clinic (a) Soiled dressings
 (b) Asphyxia

- Treat (a) Re-open the wound
 (b) Turn out the clot
 (c) Ligate the bleeding point

(6) Recurrent laryngeal trauma

- Etio (a) Pressure from œdema or hæmorrhage
 (b) Crushing by forceps
 (c) Inclusion in ligature

Treat, Prophylactic

- (a) *Leave in posterior slice of thyroid*
 (b) *Ligate the inferior thyroid within the thyroid tis*
 (c) *Preliminary visualisation of the nerves*

- (7) Shock
 (8) Collapse of the lung
 Sequelæ (1) Altered voice Recurrent nerve trauma
 (2) Recurrence of toxicosis Too little excision
 (3) Myxoedema
 Etio Too much excision
 Treat Thyroid medication or implantation

Post-oper stages

- (1) Stage of reaction
 Time Immediate post-operative period
 Clinic Thyroid crisis
 Duration 2 to 3 days
 (2) Stage of primary improvement
 Time After first stage
 Clinic Subsidence of crisis → apparent cure
 Duration 2 to 3 weeks
 (3) Stage of primary relapse
 Time After return home
 Cause Want of rest and excitement
 Clinic Mild toxicosis
 Duration 2 to 3 months
 (4) Stage of instability
 Time After 2 to 3 months
 Clinic (a) Cured when protected
 (b) Toxic syndrome when excited
 Duration 2 to 3 years
 (5) Stage of complete cure
 Results Best in late secondary thyrotoxicosis
 (a) Heart troubles 80% benefited
 (b) Glycosuria improved
 (c) Mental disturbances better
 (d) Exophthalmos slow in improvement

(4) THYROID CARCINOMA

- Contraind (a) Presence of dilated veins
 (b) Wide involvement of muscles
 (c) Presence of secondary deposits
 (d) Evidence of advanced local pressure or ulceration
 (1) Severe cough
 (2) Blood-stained sputum
 (3) Recurrent laryngeal nerve palsy
 (4) Big blood vessels
 (5) Esophagus

Preoper X Ray exposures

- Operations (1) Local growth
 Partial or hemi thyroidectomy
 (2) Local growth in diffuse goitre
 Complete thyroidectomy
 (3) Diffuse growth.

- (a) Ligation and excision of internal jugular vein
On the side of greater involvement
- (b) Complete thyroidectomy
- + (c) Crile's block dissection

Post oper X Ray exposures

IMPORTANT POINTS

- (1) *Thyroid tumours move on deglutition*
- (2) Signs of goitre
 - (a) Anatomical
 - (α) Deformity
 - (β) Pressure signs
 - (b) Physiological
 - (α) Hyper thyroidism
 - (β) Hypo thyroidism
- (3) Differential diagnosis in thyrotoxicosis
 - (a) Primary thyrotoxicosis
 - (α) Goitre not prominent
 - (β) Exophthalmos and nervous syndrome prominent
 - (γ) (α) and (β) are simultaneous
 - (b) Secondary thyrotoxicosis
 - (α) Goitre prominent
 - (β) Exophthalmos & nervous syndrome non prominent
 - (γ) Cardio vascular signs prominent
 - (δ) (α) precedes (γ) by many years
- (4) *Keep a watch for toxic signs in cases of non toxic goitre receiving Lugol's iodine*
- (5) *Lugol's iodine should not be used over a prolonged period and is not a substitute for operation its chief value is in the pre operative and post operative periods*
- (6) *Nodular involutonal goitres and innocent thyroid tumours are pre cancerous*
- (7) *Biopsy is of extreme importance in thyroid surgery*
- (8) *A local focus in a bone in old age examine thyroid*
- (9) *Colloid adenoma is not a new growth it is a degeneration cyst*
- (10) *In retro sternal goitre beware of sudden severe respiratory crisis during the night*
- (11) *Physiological thyroid enlargement occurs when the gland is unable to meet without effort the increased demands of a physiological emergency such as puberty, pregnancy, climacteric etc Enlargement persists when it is unable to meet the demands of the maturing or matured body*
- (12) *Physiological sequence in thyroid*
 - (a) Normal thyroid
 - + (b) Increased physiological demands

- ↓(c) Hypertrophy + hyperplasia physiological goitre
- ↓(d) Involution
- ↓(e) Hyper involution involutonal goitre

- (13) Owing to the constantly varying demands of the body throughout life the cycle of normoplasia → hyperplasia → involution → hyper involution continues
- (14) External laryngeal nerve (to cricothyroid) is in very real danger during the ligation of superior thyroid artery, causing temporary weakness of voice (*ligate the sup thyroid vessels as near the upper pole as possible*)
- (15) Damage to one external laryngeal nerve causes temporary husky voice, damage to one recurrent laryngeal nerve causes permanent huskiness.
- (16) Apart from neoplasm, non toxic goitre in all its stages originates in hyperplasia, either diffuse or localised, and all the succeeding changes result from involution—normal, excessive or incomplete—and fibrosis
- (17) Earlier the toxic change supervenes on a colloid goitre, more nearly do the signs and symptoms approach those of primary toxic or exophthalmic goitre
- (18) *The manifestations of toxic goitre differ according to variations in three factors*
 - (a) *Intensity of stimulation*
 - (b) *State of thyroid epithelium*
Normal or involuted
 - (c) *Age and quality of heart*
- (19) *Primary toxic goitre is most common in early adult life*
Early secondary type begins to be met with in the third decade and late secondary type comes on about the time of climacteric
- (20) *As the period between the first appearance of goitre and the onset of toxic symptoms lengthens less frequent and less pronounced are the eye signs, they are absent in late toxic goitre*
- (21) In children, thyrotoxicosis is characterized by abrupt and rapidly developing clinical course
 - (a) Nervousness
 - (b) Goitre
 - (c) Tachycardia
 - (d) Exophthalmos.
- (22) In primary toxic goitre toxic features have developed in a thyroid gland which is healthy, in secondary toxic goitre, toxic features have developed in a gland which is already a seat of colloid goitre
- (23) *Operation gives best results in late secondary thyrotoxicosis with cardiovascular syndrome*

- (24) Colloid adenoma is a cystic degeneration of local involutonal nodule, foetal adenoma is a new growth
- (25) Reduction in the amount of colloid and epithelial proliferation are characteristic features of toxic goitre
- (26) *Iodine produces very marked temporary amelioration of symptoms due to involutinary changes in toxic goitre*
- (27) Manifestations of secondary toxic goitre are less pronounced than those of primary toxic goitre, as the first supervenes on an already exhausted glandular epithelium, while the second supervenes on a physiologically active gland
- (28) *The effect of toxic goitre in young patients is on the central nervous system, while in later life, it acts chiefly on cardiovascular system*
- (29) Primary Graves' disease is a condition affecting young women in whom the goitre and toxic syndrome—ocular, cutaneous, circulatory, nervous and gastro intestinal—appear simultaneously and is characterised by periods of exacerbation occupying 6 to 9 months
- (30) Exophthalmic goitre is due to dys-thyroidism rather than to hyper thyroidism
- (31) Secondary Graves' disease is rarely seen except in women over 40, in whom a simple goitre or a group of adenomata has been present for at least 15 years. The course is steadily progressive and symptoms mainly affect cardiovascular system
- (32) *In secondary thyrotoxicosis, preliminary iodine treatment is valueless, in primary thyrotoxicosis, iodine treatment should be given a full trial for at least six months before operation is undertaken*
- (33) *Lugol's iodine solution*

Chemistry 5% of iodine in 10% aqueous sol of pot iodide

Dose (a) 10 min daily in a glass of water for 21 days

(b) 30 min per rectum in saline

(c) 20-40 min intravenous in saline

- (34) *Thyro adenoma malignum gives rise to functioning metastases in bones where they form large, soft, pulsating tumours, the primary thyroid growth being insignificant,*
- (35) Metastases from a malignant thyroid may be physiologically active
- (36) *Malignancy practically never occurs in cases of primary toxic goitre but toxic symptoms may develop in association with malignant disease*
- (37) *85% of thyroid cancers originate in adenomata*
- (38) Gross erosion of vessel walls and finding of tumour cells within the lumen of veins, are the most valuable criteria of malignancy

- (39) Basal metabolic rate is the best guide to the amount of thyroid substance which must be taken away
- (40) Thyroid secretes thyroxine which acts as a catalyst regulating the rate of metabolism
- (41) *Every thyroid removed must undergo biopsy*
- (42) *Supervention of toxicosis in a simple goitre should lead to suspicion of malignancy*
- (43) *Thyroid carcinoma*
- (A) *Papilliferous*
- (a) Slow and of low malignancy
- (b) Lymphatic metastases
- (B) *Malignant adenoma*
- Types (a) *Metastasising* slow
- (b) *Proliferating* rapid and highly malignant
- Metastases (a) *Blood stream*
- (a) *Bones* functioning secondaries
- (b) *Lungs*
- (b) *Lymphatic*
- Regional lymph nodes
- (C) *Scirrhus*
- Local and lymphatic infiltration
- (44) Sudden increase in size onset of toxicity, altered contour, fixation pressure altered voice enlarged lymph nodes hæmoptysis or any local bone lesion in an elderly patient who has had a goitre should arouse a suspicion of malignancy
- (45) Remove a single circumscribed enlargement in the thyroid in a person in the cancer period of life, as soon as it begins to cause discomfort
- (46) In malignancy of the thyroid, extirpation should always be followed by deep X Ray therapy
- (47) Dysphagia with thyroid enlargement should arouse a suspicion of malignancy
- (48) *In hypo thyroidism, all activities of body are depressed*
- (49) Prostate is enucleated from its true capsule, thyroid is removed with its true capsule from its false capsule.
- (50) *Any kind of a febrile tachycardia must be looked upon as possibly of thyroid origin*
- (51) *Outstanding thyrotoxic syndrome*
- (1) *Cardiovascular*
- (2) *Nervous*
- (3) *Ocular*
- (4) *Muscular*
- (5) *Metabolic*
- (6) *Gastro intestinal*

- (52) Sequence of cardiac disturbances in thyrotoxicosis .
 (a) Simple tachycardia
 (b) Dilatation
 (c) Functional mitral regurgitation
 (d) Cardiac irregularity
- (53) *In hypo thyroidism, various milestones in the course of the child's development are reached much later than normal*
- (54) One of the most interesting developments in surgery of the thyroid is the *improvement in cases of angina pectoris and congestive heart failure after removal of the gland* which lessens the amount of work to be done by the heart by lowering the metabolic rate
- (55) *Three chief complications of total thyroidectomy are .*
 (a) *Injury to recurrent laryngeal nerve*
 (b) *Parathyroid deprivation*
 (c) *Myxœdema*
- (56) *To obtain good results in major surgery, the most meticulous personal care should be given to the patient before and after the operation, a good operator is not necessarily a good surgeon—in fact, a good operator may be a menace to the science of surgery*
- (57) Every vestige of the thyroid gland should be removed in heart indications, anginal type of cardiac failure is benefited more than congestive heart failure (rheumatic or hyper tensive) by the total thyroidectomy
- (58) *Heart patients who do not respond to rest or medical treatment, do not derive any benefit from the total thyroidectomy, which should not be done in hopeless cases*
- (59) *Position of recurrent laryngeal nerve*
 (a) *Penetrating the gland*
 (b) *Adherent to the gland*
 (c) *Tracheo œsophageal sulcus.*
- (60) Cartilaginous prominence of inferior cricothyroid articulation is a valuable surgical landmark for recurrent laryngeal nerve as it enters the larynx, it may pass anterior or post to or lie between the branches of inf thyroid artery
- (61) *Bone metastases may be the first indication of thyroid cancer as in prostatic cancer*
- (62) Persistent growth of an adenoma with fixation to the surroundings should arouse suspicion of thyroid malignancy
- (63) Presence of distant metastases should not necessarily be a contraindication for removal of an encapsuled and obstructing malignant adenoma.
- (64) Clinical diagnosis of thyroid malignancy can only be made after the growth invades the surrounding tissues
- (65) Operability of thyroid malignancy depends on the extent of the local lesion and the absence of distant metastases.

- (66) During removal of a carcinomatous thyroid, it is usually unnecessary to remove adjacent lymph glands unless they are obviously involved
- (67) *Thyro glossal fistulae are in the midline of the neck, near about the hyoid and may be multiple they are easily mistaken for tuberculous sinuses, X Ray after lipiodol is a good pre operative step*
- (68) *It is finesse, not force, that brings success in goitre—in fact in any surgery*
- (69) Pneumonia is the most common cause of death in elderly goitrous patients after thyroidectomy
- (70) In thyrotoxic thyroidectomy, it is better to remove too much than too little.
- (71) Factors determining the extent of thyroid to be resected
 - (a) Severity of thyrotoxicosis
 - (b) Size of the gland
 - (c) Involution following iodine medication
Pale oedematous gland
- (72) Initial attack on upper pole and minimal use of silk ligatures are modern variations in thyroidectomy
- (73) Exophthalmos is best treated by early thyroidectomy, as it is more likely to persist in long standing cases
- (74) Injury to one recurrent laryngeal nerve is an unfortunate accident, resulting in hoarse voice, while injury to both recurrent laryngeal nerves is a serious surgical calamity giving rise to dyspnoea. Preliminary dissection and visualisation of the nerve should be practised before cutting or clamping any tissue nearby, especially the inferior thyroid arterial branches
- (75) *Factors in lowering mortality of thyroidectomy for thyrotoxicosis are*
 - (a) *Early operation*
 - (b) *Multiple stages operation*
 - (c) *Local and mental analgesia*
 - (d) *Gentle, precise bloodless technique*
- (76) Toxic thyroid disease is a very deadly condition in Negroes.
- (77) Kocher used collar incision in 1898, which was described by Bækel some thirteen years before
- (78) It was Sir Thomas Dunhill who instituted the modern bilateral operation for thyrotoxicosis
- (79) Tetany is very rarely seen today because of the almost universal practice of *preserving a small slice of thyroid tissue in relation to the hilum of the gland i.e. that part at which terminal branches of the inf thyroid art. enter the gland*, both the recurrent nerve and the parathyroid are spared

- (80) Presence of toxic symptoms with a localised adenoma is suggestive of the onset of carcinomatous change
- (81) *No operation on colloid goitre should be undertaken unless some complication is present*
- (82) *Many of the colloid goitres turn toxic by prolonged use of Lugol's iodine*
- (83) *Clinical types of toxic goitre*
 - (a) *Vascular type*
 - (b) *Nervous type*
 - (c) *Goitrous type*
 - (d) *Metabolic type*
- (84) *Clinical forms of carcinoma thyroid*
 - (a) *Latent type secondary to simple goitre*
 - (b) *Localised pseudo adenoma type*
 - (c) *Secondary deposit type*
- (85) Use of X Rays is most helpful and almost specific in thyroid carcinoma and so should be used in every case as a post operative measure or a palliative step
- (86) No cyst or tumour in the line of thyroglossal duct should ever be operated upon until it is certain that there is a normal portion of thyroid in the normal place
- (87) If a patient with a goitre is suffocating, assume always that the goitre is the cause, urgent dyspnoea may follow a sudden hæmorrhage into a cystadenoma of thyroid, especially if retro sternal
- (88) *Treatment of retro sternal goitrous asphyxia is immediate aspiration of the cyst or decompression and extrusion of the lobe Tracheotomy is useless*
- (89) Causes of dyspnoea in goitre
 - (a) Pressure on trachea
 - (a) Retro sternal goitre
 - (b) Hæmorrhage
 - (1) Intra cystic
 - (2) Post thyroidectomy
 - (b) Bilateral recurrent laryngeal trauma
 - (c) Tracheal collapse
- (90) Real justification of iodine therapy in thyrotoxicosis is its value as a pre operative treatment in primary cases, it gives bad results in secondary cases
- (91) Pre operative careful preparation of patients requiring thyroidectomy for thyrotoxicosis, is the key note to uniform success (a) eradication of septic foci + (b) iodine + (c) rest, until the patient is gaining weight and overcoming mental instability and muscular weakness must always be enforced before every thyroidectomy
- (92) Preliminary ligature of sup and inferior thyroid vessels under local anæsthesia sometimes improves the cases,

where iodine therapy and rest have failed and where thyroidectomy is too severe a procedure as judged from the state of the patient

- (93) *Patients with active hyperthyroidism find difficulty in mounting on to a high box or stool in the erect posture, owing to weakness of quadriceps extensor*
- (94) Essential points in thyroid surgery are gentle manipulations and scrupulous hæmorrhage. If more than 20 oz. of blood is lost, it is a danger signal. Actual loss of blood can be ascertained by weighing the swabs before and during the operation
- (95) *Extra care should be used in ligating vessels in the neck, the patient should be asked to cough and strain before final closure of the wound*
- (96) If glycosuria is not controlled by insulin in thyrotoxicosis, thyroidectomy becomes imperative
- (97) Thyrotoxicosis may lead from slight loss of mental balance to complete mental derangement
- (98) Cellulitis in the midline in the lower half of the neck is most often secondary to acute thyroiditis
- (99) *Nervous symptoms abate, weight is regained, muscular weakness disappears, but exophthalmos lags behind after thyroidectomy for thyrotoxicosis*
- (100) Superior laryngeal nerve supplying inter arytenoids, is as important as recurrent laryngeal
- (101) *Intra thoracic goitre should always be borne in mind in obscure cases of asthma or dyspnoea or mediastinal tumour*
- (102) *For practical purposes all intra thoracic goitres are adenomatous in origin, thyrotoxicosis is rare in these cases*
- (103) *Presence of a mediastinal lesion should always be suspected in the presence of dilated superficial thoracic veins*
- (104) Para goitrous lesions in goitrous areas
 - (a) Arrest of growth
 - (b) Mental deficiency → idiocy
 - (c) Stammering
 - (d) Deaf mutism.
- (105) Exophthalmos is not due to thyroxine but is caused by thyrotropic hormone of the anterior pituitary and is usually the last sign to clear up after operation
- (106) *Digitalis is ineffective in thyrotoxic tachycardia unless there is cardiac failure*
- (107) *Dyspnoea is the commonest symptom of malignant thyroid*
- (108) Ordinary diffuse colloid goitre is not associated with any tendency to malignant change.

- (109) Carcinoma thyroid resembles carcinoma prostate, in which prognosis is bad except in cases accidentally discovered on histological examination of the excised specimen
- (110) It is best to assume that all malignant tumours of the thyroid are malignant adenomas and to resect the veins along with the tumour
- (111) *All patients, at whatever age, with unexplained arrhythmias, should be suspected of thyrotoxicosis*
- (112) Masked hyper thyroidism
 - (a) Cardio vascular irregularity
 - (b) Emotional temperament
 - (c) Staring look
 - (d) Fine tremors
 - (e) Loss of weight
 - (f) Tendency to require fewer bed clothes
 - (g) Glycosuria
 - (h) Gastro intestinal syndrome
- (113) For thyrotoxicosis inferior thyroid artery should be ligated rather than the superior, as it is the main artery to the parenchyma, but the latter is more accessible
- (114) Most important single feature relating to mortality of the surgery for thyrotoxicosis, is the pre-operative decision as to how severe the thyroid intoxication is *The patient must be seen when at his worst, before operation*
- (115) High carbohydrate diet is essential in the pre operative period of thyrotoxicosis, as hepatic insufficiency is a factor in fatal cases.
- (116) *Be sure of complete hæmostasis and absence of all respiratory difficulty at the conclusion of thyroid operation*
- (117) *Laterally placed aberrant thyroids are very liable to undergo malignant degeneration and are easily mistaken for lymph nodes*
- (118) Immediate cause of all simple goitres is failure of access of sufficiency of iodine to the thyroid, in endemic goitre, it is due to environmental deficiency of iodine, in sporadic goitre, it is due either to interference with absorption of iodine or to relative iodine deficiency caused by increased demand by the body, than is available in the thyroid
- (119) *Thyrotropic hormone of the ant pituitary is the potential causative agent of Graves' disease*
- (120) *The use of the pulse rate and the blood pressure as an index of basal metabolic rate, is theoretically sound and practically useful*
- (121) Carcinoma thyroid is usually of low grade malignancy and yet relatively radio sensitive.

(β) Accidental : (See under Thyroid)
 . In thyroidectomy

(2) **Alkalaemia :**

- (a) Gastric tetany
 Incessant vomiting
- (b) Hyperpnoea
- (c) Excessive ingestion of alkalis

(3) **Nephritis**

(4) **Rickets and osteomalacia**

Clinic (1) **Carpopedal spasm :** Trousseau

Obstetric position of hands

(2) **Facial irritability :** Chvostek

Tap on facial nerve → facial spasms

(3) **Laryngismus stridulus :**

Crowing respiration

(4) **Galvanism :**

Increased excitability of motor nerves to galvanic currents

(5) **Low serum calcium :**

8-6 mgm per 100 c.c.s

Treat (1) **Intravenous parathormone :**

10-30 units a day

(2) **Intravenous calcium :**

- (a) Ca chloride
- (b) Ca gluconate 10 c.c.s of 10%
- (c) Ca lactate 40-60 gms
 5% solution every 2 hours

(3) **Irradiated ergosterol**

(4) **Parathyroid grafts**

(2) **CALCIUM DISTURBANCES**

(1) **Opacity of the lens**

(2) **Brittleness and ridging of nails**

(3) **Loss of hair and dental enamel**

(4) **Low serum calcium :**

8-6 mgm per 10 c.c.s

(IV) **HYPER PARATHYROIDISM .**

Etio (1) **Hyperplasia** bilateral

(2) **Adenoma :** Unilateral

Types (A) **Primary :**

Path (a) **Hyper parathyroidism**

↓ (b) **Renal disease**

Diag (a) **Unilateral hyperplasia**

(b) **High serum calcium**

(B) **Secondary :**

Path (a) **Renal disease**

↓ (b) **Hyper parathyroidism**

↓ (c) **Bone dystrophies**

Diag: (a) Bilateral hyperplasia
(b) Parathyroid tumor

Clinic. syn. (1)

(2) " " " " " "

(3)

(4) Abnormal calcifications

(5) Gastro-intestinal disturbances

(6) High serum calcium:
: 18-20 mgm per 100 c.cs

(V) TUMOURS:

Path (1) Adenoma:

Morb ant Interlacing compact cords or masses of large
clear cells, separated by vascular spaces

(2) Carcinoma:

Morb ant (As above)

+ (a) Infiltration

(b) Metastasis.

(a) Lymphatic

(b) Blood stream

Clinic: (1) Hyper parathyroidism syndrome

(2) Parathyroid tumor

· Palpable or impalpable

(VI) PARATHYROIDECTOMY:

Tech. (1) Wide thyroid exposure

(a) Adequate thyroid incision

(b) Transverse cut of infrahyoid muscles

(2) Ligature of middle thyroid vein

(3) Rotation inwards of thyroid border

(4) Isolation & retraction of great vessels

(5) Demonstration of inferior thyroid artery

(6) Search for the adenoma

(a) Behind the thyroid lobe

(b) Behind the artery and recurrent nerve

(c) Oesophago-tracheal groove

(d) Behind the superior pole

(e) Within the thyroid tissue

: Palpate the gland thoroughly

(f) Within the thoracic inlet

(7) Excise

IMPORTANT POINTS

- (1) Parathyroids govern the calcium metabolism and abnormalities in bones in generalised osteitis fibrosa are due to parathyroid secretion causing an excessive stimulation of osteoclastic resorption of bone.

- (2) *Parathyroids are necessary for a proper deposition of calcium in osteoid tissue during periods of growth and repair.*
- (3) *Principal factor in the production of parathyroid tetany is lowering of serum calcium which produces hyper excitability of the peripheral nerves and central nervous system*
- (4) *Parathyroids play a very important part in the regulation of the calcium concentration of blood serum and maintenance of a proper balance between certain ions in the body. Tetany is hyper excitability of motor nerves and of central nervous system due to lowering of diffusible ionised calcium. In hyperparathyroidism, there is excessive mobilisation of calcium from the bones, excessive retention in blood serum and excessive excretion in urine, giving rise to decalcification of bones and tendency to urinary stones*
- (5) *Upon the correct metabolism of calcium depends*
 - (a) *Growth and stability of skeleton*
 - (b) *Irritability of muscles and nerves*
 - (c) *Coagulation of shed blood*
- (6) *The normal amount of calcium in blood is between 9 and 11 mgms per 100 ccs of blood. In tetany, there is hypocalcaemia upto 6 mgms. In parathyroid hyperplasia, there is hypercalcaemia upto 20 mgms*
- (7) *There is a danger of removal of both sets of parathyroid in operation for complete thyroidectomy and of interference with their blood supply if inferior thyroid artery is ligatured at a distance from the gland, leave back the posterior slice of thyroid tissue to ensure safety of the parathyroids and recurrent laryngeal nerves. Where thyroidectomy must be complete, have recourse to preliminary dissection, visualisation and protection of both these structures*
- (8) *A solution of calcium lactate, sufficient to provide 15 to 25 gms of calcium per day is the best way of giving calcium over long periods.*
- (9) *Either convulsions are due to hyperphosphaemic tetany and are rapidly checked by injection of 10 ccs of 10% calcium gluconate*
- (10) *Parathyroids are synergic with pancreas and under the influence of vagus, the pituitary, the thyroid and the adrenals form a synergic group under the sympathetic.*
- (11) *Dysfunction of parathyroid bodies is now definitely associated with a rather high incidence of renal lithiasis*
- (12) *Renal lithiasis may occur without any bone changes in hyperparathyroidism.*

- (13) Parathyroids may be found at practically any position, behind, below or even *in* the thyroid
 - (14) Parathyroid adenomas are usually freely movable on thyroid tissue
 - (15) We all, particularly the orthopædist and the urologist, must be on the look out for hyperparathyroidism in patients with
 - (a) Pain in the back or extremities
 - (b) Diffuse neuritis
 - (c) Arthritic pains worse on motion
 - (d) Progressive loss in stature
 - (e) Urinary stones
 - (16) *Many patients with hyperparathyroidism, who could be relieved of their condition by surgical removal of a parathyroid adenoma, have in the past and are still passing through our hands with their condition undetected and hence untreated*
 - (17) *Renal calculi may be the first sign of generalised osteitis fibrosa or of hyperparathyroidism*
 - (18) Deficiency of vitamin D may be an important factor in hyperplasia of the parathyroid
 - (19) Parathyroid enlargements occur not infrequently in nephritis, if sufficiently chronic in type
 - (20) Tetany and cataract are dangers of too extensive deprivation of parathyroids.
-

CHAPTER IV

THE ADRENALS

(I) ANATOMY

Gross Triangular, paired structure

Situated at the upper pole of the kidney

(A) Cortex Developed from mesoblast

Histology Columns of polyhedral cells with well marked nuclei

(a) Zona glomerulosa parallel to surface

(b) Zona fasciculata vertical to surface

(c) Zona reticularis irregular

Hyperplasia (1) Precocious sexual maturity

Male and female children

(2) Reversion to opposite sex

Adult females

Hypoplasia Addison's disease

(a) Asthenia

(b) Cachexia

(c) Hypoplasia

(d) Apathy

(e) Hypo-genitalism

(f) Pigmentation and bronzing

(B) Medulla Chromophil autonomic tissue

Histology Irregularly arranged cells

(a) Chromophil tissue

(b) Large blood spaces

Function Adrenaline *Sympathetic mimic*

Effects (a) Eye (a) Dilatation of pupil

(3) Retraction upper lid

(γ) Exophthalmos

(b) Heart acceleration and accentuation

(c) Bronchi relaxation

(d) Intestines (α) Inhibition of peristalsis

(3) Closure of sphincters

(e) Liver conversion of glycogen into glucose

(f) Spleen contraction

↓ Release of R B Cs. in circulation

(g) Bladder (α) Relaxation of detrusor

(3) Constriction of sphincter

(h) Uterus inhibition

(i) Skin (α) Excitation erectors pili

(3) Constriction of arterioles

(j) Splanchnic arteriolar constriction

(k) Muscles diminution of fatigue

(l) Blood pressure rise

(m) Basal metabolism; rise

Functions: Of adrenaline: *preparation for emergency*

- (1) *Re-distribution of blood*
- (2) *Stimulation of heart*
- (3) *Rise in blood pressure*
- (4) *Increase of R. B. Cs in circulation*
- (5) *Relaxation of bronchi*
- (6) *Mobilisation of glycogen*
- (7) *Diminution of fatigue*
- (8) *Inhibition of plain musculature*

(II) PATHOLOGY:

(A) CORTEX:

(1) *Vascular lesions:*

- (a) *Hæmorrhage: sudden death*
 Etio: (a) *Acute infectious diseases*
 (β) *Post operative*
- (b) *Thrombosis*
- (c) *Infarction*

(2) *Hyperplasia:*

Causes: (a) **Simple cortical nodules:**

- (a) *Fœtal*
- (β) *Sclerotic*
- (γ) *Accessory adrenals*
- (δ) *Cortical rests:*
 - (1) *Under surface of liver*
 - (2) *Epididymis*
 - (3) *Uterine adnexa*
 - (4) *Retro peritoneal tissue*
 - (5) *Upper pole of the kidney*

(b) **Simple hyperplasia:**

- (a) *Physiological: pregnancy*
- (β) *Acute infections*
- (γ) *Middle life: after 40*
- (δ) *Essential hyperplasia of virilism*

(c) **Neoplastic:**

(a) **Adenoma:**

Path. Multiple, bilateral

Morb. anat: *Well defined nodules of bright yellow colour, with an arrangement like zona fasciculata.*

(β) **Carcinoma:**

Etio: Age: (1) *Any*
 (2) *Infancy to puberty*
 (3) *Fifth decade*

Path. types: (a) *Adeno-carcinoma*

(b) *Carcinoma proper*

(c) *Diffuse carcinoma*

- Morb anat (1) Secondary degeneration
Soft yellow, cystic
(2) Growth along veins
Pulmonary and bone metastases

Clinic Of hyperplastic lesions

(1) **Precocious puberty**

- (A) Male (a) Obese form
(b) Hercules form

(B) Female obese form

(2) **Reversion to male sex** In adult females

- (a) Hirsutism of face
(b) Coarse voice
(c) Male configuration
(d) Amenorrhœa

(B) **MEDULLA**

(1) **Paraganglioma**

- Syn (a) Chromaffin tumour
(b) Pheochromocytoma

- Site (1) Sympathetic plexuses
(2) Carotid body
(3) *Adrenal medulla*
(4) Fœtal organ of Zuckerkandl

- Path (a) Pleomorphic small cells
(b) Vascular
(c) *Benign*

Etio After 40

- Clinic (a) Paroxysmal palpitations
(b) Hyperpiesia
(c) Tremors
(d) Cold extremities

(2) **Ganglioneuroma**

Etio Adults

- Path (a) Ganglion cells
(b) Nerves medullated and non medullated
(c) Glial tissue

Site Any tissue of the body *sympathetic ganglia*

Clinic Multiple white *benign* tumours

(3) **Neuroblastoma**

Syn Sympathetico blastoma

Etio Infancy or childhood

- Path (a) Deeply staining cells in rosette
(b) *Highly malignant*
(c) Metastases

- Clinic (1) *Retro peritoneal infiltrating mass*
(2) Extensive metastases

(A) Hutchinson's syndrome

Primary Left adrenal

Metastases. Bones ribs, orbits, skull

Via Thoracic duct

(B) Pepper syndrome

Primary Right adrenal

Metastases Liver and lungs

Via Lymph channel

(4) Melanoma :

Etio Adults

Origin Neurogenous

(5) Metastatic growths

Primary in bronchi

(III) ADRENAL OPERATIONS

(1) Adrenal denervation

Ind (a) Neuro-circulatory asthenia

(b) Essential hyper tension

(c) Hyper thyroidism

(d) Diabetes secondary to hyper thyroidism

Tech (1) Position kidney

(2) Incision kidney \rightarrow ureter

(3) Exposure and isolation of kidney

(4) Exposure of adrenal

(5) Cutting of nerve filaments

(2) Adrenalectomy

Ind Adreno-genital syndrome

Treat (a) Trans thoracic route (Broster)

(b) Sub-diaphragmatic lumbar route (Walters)
Mobilisation of last rib

(c) Trans peritoneal route (Cahill)

Results (a) Good in post puberal virilism

(b) Disappointing in pre puberal virilism

(IV) ADRENO GENITAL SYNDROME

Def Appearance of secondary male characters in the female,
associated with retrogression of primary and
secondary feminine characters

Etio (a) Hereditary

(b) Familial

Factors (1) Adrenal hyper function .

(a) Hyperplasia

 \downarrow (b) Adenomata \downarrow (c) Adeno carcinomata

(2) Age :

(a) Sexual immaturity

(b) Sexual maturity

Clinic: (1) Hyper-trichosis:

- (a) Chin
- (b) Lips
- (c) Chest and abdomen

(2) Male contour of the body:

- (a) Overgrowth of skeleton
- (b) Shoulders broader than pelvis
- (c) Enlarged clitoris
- (d) Deepening of voice

(3) Immature development of female genitalia:

- (a) Enlargement of male elements
- (b) Diminution of female elements

(4) Psychological change to male type**(5) Migrainous headache****Classific: (1) Adrenal pseudo hermaphroditism:**Cause: *Changes before sexual maturity***(2) Adrenal virilism:**Cause: *Changes after puberty***(3) Achard Thier's syndrome:**Cause: *Multi glandular hyperplasia.*

- (a) Adrenal
- (b) Ovaries
- (c) Pituitary
- (d) Thyroid

Clinic: (a) Facial hyper-trichosis

- (b) Obesity
- (c) Glycosuria
- (d) Hyper tension
- (e) Amenorrhœa

Treat: Unilateral adrenalectomy.**IMPORTANT POINTS**

- (1) *General effect of adrenaline is to redistribute the blood in the body and adapt the circulation better to cope with conditions of stress*
- (2) *Fuchsinophil granules in adrenal cortex is the main factor in virilism*
- (3) Cortex of adrenal develops from genital mesothelium.
- (4) Medulla of adrenal develops from sympathetic ganglionic crest.
- (5) Development of adrenal becomes complete in second year of post natal life
- (6) Anencephaly and adrenal dystrophy co exist and the former may be the result of the latter.
- (7) Adrenal medulla is closely concerned, in association with thyroid, in the regulation of body temperature.

- (8) Cortical adrenal rests are common, most common in the liver and rarely form the sites for any tumour
- (9) Adrenal hyperplasia in pregnancy is associated with hypercholesteræmia and increased lipid metabolism
- (10) Essential hyperplasia of the adrenal cortex which is accompanied by virilism is the only form of simple enlargement which is associated with a definite clinical syndrome or which calls for surgical interference
- (11) *Cortical carcinomata from the bulk of adrenal neoplasms*
- (12) *Metastases*
 - (a) *Pulmonary metastases in adrenal malignancy*
 - (b) *Skeletal metastases in kidney malignancy*
- (13) *Adrenal cortex exerts a profound influence upon the development and functions of the sex glands, causing*
 - (a) *Hermaphroditism*
 - (b) *Hetero sexual prematurity*
Adreno genital syndrome
 - (c) *Homo sexual prematurity*
Pubertas præcox
 - (d) *Virilism*
- (14) Clinical syndrome
 - (A) Simple hyperplasia
Puberal virilism
 - (B) Adrenal adeno carcinoma
 - (a) Childhood sexual changes
 - (α) Hetero sexual
 - (β) Homo sexual
 - (b) Virilism in elderly women
- (15) Adrenal clinical syndrome
 - (A) Simple hyperplastic hyperfunction
 - (a) Foetal hermaphroditism
 - (b) Puberal virilism
 - (B) Adeno carcinoma
Masculinisation at any age
 - (C) Pure carcinoma
No effect on sexual growth
- (16) *Fuchsinophil material of the adrenal cortex seems to be functioning as a masculinising hormone*
- (17) Hermaphroditism of adrenal origin is the immediate and virilism is the delayed or latent result of a failure of inhibition of the normal male phase of the female foetus due to presence of fuchsinophil material in adrenal cortex
- (18) Anterior pituitary may have some control on adrenal cortex as Cushing's syndrome would show
- (19) Tumours of the adrenal medulla

- (A) Innocent and in adults :
 - (a) Paraganglioma or chromaffin tumour
 - (b) Ganglioneuroma
 - (B) Malignant and in children :
 - : Neuroblastoma
- (20) *Orbital tumour of the left side with ecchymosis and exophthalmos may be the first sign of left adrenal neuroblastoma.*
- (21) *New growths of the adrenal*
- (A) *Cortex :*
 - (1) *Adenoma*
 - (2) *Carcinoma :*
 - (a) *Adeno carcinoma*
 - (b) *Fully developed*
 - (c) *Diffuse*
 - (B) *Medulla :*
 - (1) *Innocent :*
 - (a) *Paraganglioma*
 - (b) *Ganglioneuroma*
 - (2) *Malignant .*
 - (a) *Neuroblastoma*
 - (b) *Melanoma*
 - (c) *Metastatic.*
- (22) *Results of adrenalectomy are good in post puberal virilism; but are disappointing in pre puberal virilism.*
- (23) *The sexual aberrations are due to unbalance between the ovary and the adrenal, associated with a failure on the part of anterior pituitary.*
- (24) *There is common origin for adrenal cortex and sex gland; determination of sex takes place about the seventh week and fuchsinophil reaction commences 2-4 weeks later.*
- (25) *The fuchsinophil substance present in the inter cellular spaces in the adrenal cortex and acting via blood stream, becomes activated at times and gives rise to male phase Virilism may be due to failure to maintain the normal balance between anterior pituitary and female adrenal, sometimes accompanied by pituitary dysfunction.*
- (26) *Unilateral adrenalectomy is successful in adreno genital syndrome.*
-

CHAPTER V

THE GONADS

(I) ANATOMY

(1) TESTIS

Structure (1) Seminiferous tubules

(a) Spermatogonia

↓ (b) Spermatocytes

↓ (c) Spermatids

↓ (d) Spermatozoa

(2) Interstitial cells

(a) First puberty 4th foetal month

(b) Second puberty adolescence

(c) Third puberty senile

Functions (1) Development of sexual system

(a) Reproductive apparatus

(b) Secondary sexual characters

(c) Sex psychology

(2) Effect on body growth

Hypo-activity → gigantism + obesity

(3) Effects on other endocrines

(a) Involution of thymus

(b) Depression of pituitary

Control Gonadotropic hormone of ant. pituitary

(2) OVARIES

Structure (1) Graafian follicle

(a) Ovum

(b) Liquor folliculi

↓ (2) Corpus luteum

Burst graafian follicle with hæmorrhage

(3) Interstitial cells

Secretions (A) Oestrin

Distribution (a) Ovary

(b) Placenta

(c) Foetal membranes & liquor amni

(d) Pregnant urine

(B) Lutein In pregnancy

From corpus luteum

Control Gonadotropic A and B of ant pituitary

Functions (A) General Oestrin

(1) Development & maturity of sex organs

(2) Secondary sexual characters

(3) Nutrition of genital apparatus

(4) Menstruation

(B) In pregnancy Lutein

(1) Cessation of menstruation

- (2) Embedding of ovum
- (3) Development of placenta
- (4) Development of breasts

(II) SEX HORMONE THERAPY

(A) FEMALE HORMONE THERAPY

(1) Gonadal hormones • Ovarian

(A) Follicular hormone Oestrin

Preparations (a) *Oestradiol benzoate*

- (1) Dimenformon (Organon)
- (2) Oestroform B (B D H)
- (3) Progynon B (Schering)

Source Ovary

Dose 50 000 units intramuscular

(b) *Oestrone*

- (1) Menformon (Organon)
- (2) Oestroform (B D H)
- (3) Progynon (Schering)
- (4) Unden (Bayer)

Source Pregnancy urine

Routes (a) Oral

(b) Inunction

(c) Pessaries

(d) Implantation under skin

Action (a) Growth of female genitalia

(b) Secondary sex characters

(c) Stimulation of uterus

(B) Luteal hormone Progesterone

Preparations (a) Progestin (Organon)

(b) Progestin (B D H)

(c) Proluton (Schering)

(d) Lutren (Bayer)

Source Corpora lutea of sows

Dose Intramuscular 5 mg

Action (a) Formation of placenta

(b) Nutrition of embryo

(c) Inhibition of uterus

(2) Gonadotropic hormones Ant pituitary

(A) Gonadotropic A follicular

Preparation Anostab (Boots)

Source Pregnant mare's serum

Dose 100-200 units

Action Stimulates follicle formation

(B) Gonadotropic B Luteinizing

Prepar (a) Pregnyl (Organon)

(b) Antuitrin S (P D & Co)

(c) Gonan (B D H)

(d) Prolan (Bayer)

Source	Pregnancy urine, placenta
Dose	100-500 units
Action	Stimulates luteum formation

Indications

(1) ARREST OR RETARDATION OF PUBERTY

Syn Primary amenorrhœa

Types (A) Primary hypogonadism

Syn Eunuchoidism

Path (1) Primary ovarian hypoplasia

↓ (2) Defective ovarian hormones

+ (3) Uterine hypoplasia

Clinic (a) Absent secondary sex characters

(b) Disproportioned skeleton

(c) Primary amenorrhœa

Treat Gonadotropic + gonadal

Results Bad Ovary does not respond

(B) Secondary hypogonadism

Syn Infantilism

Types (1) Endocrinal

(a) Ant pituitary deficiency

Path (a) Deficient gonadotropic

↓ (β) Deficient ovarian hormone

Clinic (a) Absent secondary characters

(β) Uterine hypoplasia

(1) Primary amenorrhœa

Treat Gonadotropic A & B

Results Temporary

(b) Hypo thyroidism

Path Secondary ovarian hypoplasia

Clinic Sex developmental defects

Treat Thyroid therapy

Results Good

(2) Cachectic

Etiology Wasting or nutritional disease

Path Ovarian hypoplasia

Clinic Temporary retardation

(a) General development

(b) Sexual development

Treat Gonadotropic A

(2) DISTURBANCES OF MENSTRUATION

(A) Secondary amenorrhœa

(a) Simple secondary amenorrhœa

Predisposing Shock, climate

Cause (a) Pituitary deficiency

(β) Ovarian deficiency

Treat Gonadotropic + follicular

(b) *Symptomatic secondary amenorrhœa :*Etiology: (1) *General conditions :*

(a) Pulmonary tuberculosis

(β) Cachexia

(2) *Glandular diseases :*

(a) Pituitary tumours

(β) Adrenal tumours

(γ) Thyrotoxicosis

Treat: Treat the primary cause

(B) *Menorrhagia :*(1) *Metropathia hæmorrhagica :*

Etiology: Young women about puberty

Cause: (a) Excess of follicular hormone

+ (b) Deficiency of corpus luteum

Treat: (a) Luteal hormone

+ (b) Gonadotropic B.

(2) *Ordinary menorrhagia :*

Treat: Gonadotropic + Luteal

(C) *Dysmenorrhœa :*(1) *Deficient follicular hormone :*

Clinic (a) Uterine hypoplasia

(b) Scanty menses

Treat: Follicular hormone

(2) *Deficient luteal hormone :*

Path: Excessive uterine contractility

Treat: Luteal therapy

(3) *CLIMACTERIC SYNDROME .*(A) *Climacteric stages :*(1) *Increased follicular hormone :*

Path: " " " " " " " " " "

Clinic: "

Treat: (

(

(c) Luteal therapy

↓ (2) *Decreasing follicular hormone :*

Path: Uterine involution and atrophy

Clinic: Amenorrhœa

Treat: Follicular therapy

↓ (3) *Increasing gonadotropic hormone :*

Clinic: Amenorrhœa + vasomotor syndrome

Treat: Follicular therapy

(B) *Post-climacteric syndrome :*Clinic: (a) *Atrophic senile vaginitis*(b) *Pruritus*(c) *Kraurosis vulvæ*

Treat Follicular hormone therapy

(4) STERILITY

Etio (1) Uterine failure to respond to ovary
(2) Endocrine

Etio (a) Ant pituitary
(b) Ovarian
(c) Hypothyroidic

Treat (a) Gonadotropic A + follicular
(b) Thyroid therapy

(5) ABNORMALITIES OF PREGNANCY

(A) Repeated miscarriages and abortions

(a) *Prolan progesterone deficiency*

Clinic Series of miscarriages and abortions

Treat Progesterone + Gonadotropic B

(b) *Thyroid deficiency*

Treat Thyroid therapy

(E) Intra uterine foetal death

Path Reduction of follicular hormone

Treat Follicular hormone therapy

(II) MALE HORMONE THERAPY

Hormones (1) Gonadal hormone Testicular

Testosterone propionate

Prep (a) Testoviron (Schering)
(b) Neo hambroel (Organon)
(c) Perandren (Ciba)

Dose 25-50 mgm intramuscular
2 or 3 times a week

(2) Gonadotropic hormones Ant pituitary
(See under Female Hormones)

Indications

(1) ARREST OR RETARDATION OF PUBERTY

Types (A) Primary hypogonadism

Syn Eunuchoidism

Path (a) Primary testicular hypoplasia

↓ (b) Defective testicular hormones

+ (c) Defective spermatogenesis

Treat Gonadotropic + testosterone

Results Not good

(B) Secondary hypogonadism

Syn Infantilism

Types (a) *Endocrinal*

Etio (a) Anterior pituitary
(β) Thyroid

(b) *Cachectic*

Treat Gonadotropic + gonadal

(2) IMPOTENCE AND STERILITY

(A) Impotence

Treat (a) Psycho therapy

(b) Gonadotropic + gonadal

(B) Sterility

(a) *Defective gonadal hormone*

Path Non viable spermatozoa

Treat Testosterone

(b) *Defective gonadotropic hormone*

Path Aspermia or oligospermia

Treat Gonadotropic

(3) CRYPTORCHIDISM

Treat Gonadotropic B (Prolan)

Time Second dentition

(4) PROSTATIC HYPERTROPHY

Treat Testosterone

25-50 mgm 2 or 3 times a week

(III) REJUVENATION OPERATIONS

(1) Steinach

Syn Vasectomy

Ind (a) Sterility bilateral

(b) Rejuvenation

Tech (a) *High*

Site At the internal abdominal ring

(b) *Middle*

Syn Steinach I

Site External abdominal ring

(c) *Low*

Site At the top of the testis

(d) *Steinach II*

Site Between testis & epididymis

Steps (A) *Steinach I*

(a) Local anaesthesia

(b) Isolation of the vas *transfix with needle*

(c) Exposure of the vas

(d) Dissection of the vas

(e) Exteriorisation of the vas

(f) Excision of the vas 1 inch
After ligature of both ends

(g) Closure

(B) *Steinach II*

(a) Exposure of testis

(b) Silk ligature after crushing
Between testis and epididymis

(c) Closure

After treat Support

(2) Voronoff's testicular grafts

Ind (a) Rejuvenation

(b) Hypogonadism

(b) Sites (α) Tunica vaginalis
(β) Rectus sheath

IMPORTANT POINTS

- (1) Ovarian hormones are responsible for uterine cycle; ovarian cycle is under the control of anterior pituitary.
- (2) On the whole the results of treatment in primary and secondary developmental hypogonadism are not as satisfactory as could be desired
- (3) Psychological influences do play an important part in *menstrual disorders*.
- (4) In any case of simple secondary amenorrhœa in which there is a low threshold of follicular hormone, there is every indication for the employment of follicular hormone therapy.
- (5) Rational treatment of any case of menorrhagia in which a failure of corpus luteum is suspected, is the administration of luteal or gonadotropic B hormone
- (6) Majority of cases of endocrine sterility are the result of failure of ovulation due to anterior pituitary defect.
- (7) Progesterone is responsible for the embedding of the ovum and the successful continuation of pregnancy depends on its presence in adequate quantity especially during the first four months of pregnancy.
- (8) *Repeated miscarriages and abortions may result from thyroid deficiency and good results can be obtained with thyroid therapy*
- (9) Male hormone was first extracted from testis by MacGee in 1927 and its presence demonstrated in the urine. In 1931 Butenandt prepared androsterone from urine. In 1935 Laqueur prepared testosterone from testis
- (10) *Function of the testis is regulated from without by anterior lobe of the pituitary.*
- (11) Testis has two functions :
 - (1) Spermatogenesis
 - (2) Internal secretion
- (12) *There are two main groups of therapeutic hormones :*
 - (a) *Gonadotropic :*
: Stimulating the gonads
 - (b) *Gonadal :*
: Substitution therapy.
- (13) Psycho-therapy is most important in male impotence.

- (14) *Late descent of the testis occurs either at the second growing-up period—the time of second dentition—or at the third growing up period—puberty. Hormonal treatment is indicated just after the first period -*
- (15) *Œstrogenic therapy :*
 Ind: (a) Menopausal syndrome
 (b) Uterine hypoplasia.
- (16) *Corpus luteum therapy :*
 Ind: (a) Non ovarian sterility
 (b) Habitual abortions
 (c) Menorrhagia
 (d) Dysmenorrhœa
 (e) Eclampsia.
- (17) *Uterine hypoplasia :*
 : Alternate follicular treatment with corpus luteum therapy.
- (18) *Sex changing tumours :*
 (a) *Masculinizing tumours :*
 (a) Ovario testis
 (β) Pick's tubular adenoma
 (γ) Arrhenoblastoma
 (δ) Adrenal hypernephroma
 (u) Pituitary basophilism
 (b) *Feminizing tumour :*
 : Granulosa celled tumour · Theelin
 (c) *Retarding tumour :*
 : Seminoma.
- (19) *Testis is unisexual while ovary is bisexual; apart from progesterone, all hormones are bisexual*
- (20) *All endocrine therapy is substitution therapy. When necessity of insulin has once arisen, it is usual to have to continue it for the rest of patient's life; so also thyroid therapy in myxœdema.*
- (21) *Normal onset of ovulation at puberty depends on anterior pituitary and not on ovary.*
- (22) *Contus influences the pituitary to secrete a substance which stimulates follicular development in the ovary.*
- (23) *Mammary development is also due to lutein caused by anterior lobe of the pituitary.*

CHAPTER VI

THE THYMUS

(I) HYPERPLASIA

Cause Incomplete differentiation of sex glands

↓ Incomplete involution

Syndrome (1) Status thymolympathicus

Path (a) Inadequate circulatory mechanism

(b) Thymus hyperplasia

(c) Lymphoid hyperplasia

Clinic (a) *Sudden death*

(α) *During anaesthesia*

(β) *Acute infections*

(γ) *After trauma*

(b) *Lymphoid hyperplasia*

(α) *Enlarged tonsils*

(β) *Enlarged adenoids*

(γ) *Enlarged lymph nodes*

(c) *Enlarged thymus*

Retro-sternal dullness

(d) *Cardio-vascular weakness*

(e) *Secondary female characters*

Delicate build

(2) *Thymic asthma*

Etiol. Infants

Path (a) Hyperplastic thymus

↓ (b) *Recurrent laryngeal irritation*

(3) *Myasthenia gravis*

(4) *Endocrine disturbances*

(a) *Thyrotoxicosis*

(b) *Acromegaly*

(c) *Addison's disease*

(II) PATHOLOGICAL LESIONS

(1) *Dubois' abscess* Congenital syphilis

(2) *Thymoma* (a) *Infiltration*

(b) *Pressure syndrome*

IMPORTANT POINTS

- (1) *Never forget status thymolympathicus in children who are to undergo a tonsillectomy*
 - (2) *Screen every child for enlarged thymus before any operation under general anaesthesia*
 - (3) *Retro sternal dullness of more than usual magnitude raises the suspicion of hyperplastic thymus.*
 - (4) *Beware of delicate graceful children, they may be victims of status thymolympathicus*
-

CHAPTER VII

THE PANCREAS

(See under Diabetes in Surgery)

SOME GENERAL STATES

CHAPTER I

SHOCK

Def: (A) **Shock:**

: **General depression of vital functions,**
associated with low blood pressure

(B) **Collapse:**

: **Sudden failure of vital functions,** due to
cardiac or respiratory damage, hæmorrhage
or vasomotor anæmia

(C) **Syncope:**

: **Temporary inhibition of vital functions,**
produced by anæmic state of the brain

Types: (1) **Primary or nervous shock:**

: Cardiac inhibition of vagus

(2) **Secondary or toxic shock:**

: Absorption of histamine

(A) **Hæmatogenic shock:**

Syn: Shock hæmorrhage complex

Path: Loss of circulating blood

(B) **Neurogenic shock:**

Syn: Emotional shock

Path: Loss of central tone

(C) **Vasogenic shock:**

Syn: Histamine shock

Path: Loss of peripheral vascular tone

Etiology: (1) *Predisposers:*

(A) **Exposure and attrition:**

(a) Cold

(b) Dehydration

(c) Starvation

(d) Exhaustion

(e) Debility

(B) **Mental and physical stress**

(2) *Exciting:*

(A) **Primary shock:**

(1) Disturbances of higher nerve centres
: **Mental shock**

(2) Blows on thorax and abdomen:
: **Sympathetic plexus shock**

(3) Manipulations & exposure of viscera
: **Sympathetic sensory shock**

(4) Trauma to large nerve trunks:
: **Peripheral sensory shock**

- (5) Trauma to central nervous system :
: **Central nervous shock**
- (6) Depletion of blood volume .
: **Hæmorrhagic shock**

(B) *Secondary shock* :

- (1) Extensive laceration of tissues :
: **Histamine shock**
- (2) Acute infections :
: **Toxic shock**

(C) *Mixed shock* :

- (1) Extensive cutaneous lesions . burns
. Sensory + toxic
- (2) Extensive serous membrane lesions :
. Sensory + toxic

- Path : (1) Direct effect from *higher nerve centres*
or (2) Over stimulation of *sensory* apparatus
or (3) Over stimulation of *sympathetic* nerve ganglia
or (4) Direct *injury* to central nervous system
or (5) *Loss of blood*
or (6) *Toxic* or histamine absorption
↓ (7) **Inhibition or fatigue-paralysis :**
: **Of vasomotor centre**
↓ (8) **Capillary and venous paralytic stasis :**
(a) Stagnation
↓ (b) Anoxæmia
↓ (c) Endothelial damage
↓ (d) Transudation
↓ (e) Increased viscosity
↓ (f) Stagnation
↓ (9) Empty heart and arteries
+ (10) **Diminution in blood volume**
↓ (11) *Fall in blood pressure*
↓ (12) *Ischæmia of vital centres*
↓ (13) *Depression of all vital functions*

- Morb. anat : (1) Capillary stasis
↓ (2) Diminution in blood volume
↓ (3) Low blood pressure
↓ (4) Anæmia of brain

Clinic : (1) **Mental :**

- (a) Torpor
- (b) Anxiety
- (c) Excitement
- (d) Delirium
- (e) Apathy : to self and surroundings
- (f) Semi consciousness
- (g) *Absent pain*

- (2) **Musculature :**
: **Relaxation**

- (3) **Respiration :**
: Slow and shallow
- (4) **Pulse :**
: *Weak, rapid, running*
- (5) **Temperature :**
: *Subnormal*
- (6) **Skin :**
: *Cold, clammy, leaden grey-*
- (7) **Sphincters :**
: Relaxed
- (8) **Thirst and perspiration**
- (9) **Fall in blood pressure :** $< 80 \text{ mm.}$

Treat: (A) *Prophylactic.*

- (1) **Mental :**
: *Re assurance, optimism*
- (2) **Sedatives :**
: *Morphia, bromides, chloral*
- (3) **Warmth :**
: *Warm clothing, hot drinks*
- (4) **Food and fluids :**
 - (a) Avoid starvation
 - (b) *Glucose therapy*
 - (c) *Hydro therapy*
- (5) **Anæsthesia : Anoci association**
 - (a) Local
 - (b) Regional
- (6) **Delicate handling**

(B) *Curative :*

- (1) Rest in bed
- (2) **Reversed position :** (head low)
- (3) Warmth .

<ul style="list-style-type: none"> (a) Warm blankets (b) Hot water bags (c) Electric cradle 	}	Temp not above 95° F.
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- (4) **Narcotics :**
: **Morphia**
- (5) **Peripheral vaso constrictors :**
 - (a) **Intravenous adrenaline**
 - (b) **Pituitrin**
- (6) **Infusion : Saline or blood plasma**

Tech (a) Subcutaneous
(b) Intravenous
(c) Rectal :
: Normal saline or tap water
(d) Intraperitoneal

Ind : Dehydration

Contraind : (a) *Uncontrolled internal hæmorrhage*
(b) *Anæmia*

- (c) High blood pressure
- (d) *Decompensated heart*
- (e) *Lung condition*
- Additions: (a) Glucose: 25 c.cs of 25%
- (b) Gum acacia: 6% in normal saline
- (c) Adrenaline: 1 in 50,000
- (7) **Blood transfusion**
- (8) **Mechanical pressure:**
 - (a) Limb bandages
 - (b) Pneumatic suit
- (C) **Operations under shock:**
 - (1) **Conservative treatment:**
 - Ind: Till blood pressure rises
 - Tech: (a) Inject morphia
 - (b) Posture
 - (c) Heat
 - (d) Saline infusion
 - (e) Blood transfusion
 - (f) Local treatment
 - (α) Arrest hæmorrhage
 - (β) Inject novocain in nerves
 - (γ) Tourniquet to prevent toxæmia
 - (2) **Immediate operations: In spite of shock**
 - (a) *Severe internal hæmorrhage*
 - (b) *Rupture or perforation of hollow organ*
 - (c) *Trauma to central nervous system:*
 - (a) Depressed fracture skull
 - (b) Intracranial hæmorrhage
 - (d) *Secondary toxic shock*

CHAPTER II

ACIDOSIS

Def: *Decrease in the alkali reserve of blood*

Physio: The amount of soda bi-carb present in blood is termed the alkali reserve

Estimation: **Van Slyke's method:**

: Measure CO_2 present in the blood or plasma, which has been exposed to CO_2 at a pressure of 40 mm. of mercury

(a) Normal CO_2 content of blood :
: 40-45 vols. per 100 c.cs. of blood

(b) Normal CO_2 content of plasma :
: 55-70 vols. per 100 c.cs. of blood

Causes: (A) Increase in carbonic acid :

(a) Morphine poisoning :
: Depressed respiratory centre

(b) Bronchial obstruction :
: Accumulation of CO_2 in blood

(B) Decrease in alkali reserve :

(a) Administration of acids and acid salts

(b) **Uræmia:**
: Deficient excretion of acids

(c) **Diabetic coma:**
: Ketosis

(d) Carbohydrate starvation : ketosis

(a) Cyclic vomiting

(β) Pregnancy vomiting

(γ) Anæsthetic vomiting

Path: pH blood : 7.25 or 7.30

Alkali reserve 30-25 vols of CO_2 per 100 c.cs.

Alveolar CO_2 : 2-1.5%

Clinic: (1) Thirst + dry tongue

(2) Vomiting

(3) Air hunger + breath odour

(4) Nervous syndrome.

(a) Headache

(b) Irritability

(c) Restlessness

(d) Delirium

(e) Drowsiness

(f) Coma

CHAPTER IV

DELIRIUM

(1) DELIRIUM NERVOSUM

Syn. Traumatic delirium

Predisp. Instability of nervous equilibrium

- (a) Chronic alcoholism
- (b) Sexual excess
- (c) Senility

Etio. (a) **Operations: on genitalia**

(b) Accidents

Clinic. (1) Maniacal

(2) Low muttering type

(3) Melancholic

Compl: Chronic insanity or dementia

Treat. Symptomatic

(2) TOXIC DELIRIUM

Types: (A) *Infective: Pyogenic toxæmia*

Clinic: (a) 3 to 5 days after operation

↓ (b) Toxic absorption

↓ (c) Active restless delirium

↓ (d) Typhoid state

(B) *Chemical: Iodoform*

Clinic: (a) Nervous syndrome

(1) Excitement → hallucinations

↓ (2) Depression → coma

+ (b) Circulatory syndrome:

. Rapid, weak pulse

+ (c) Alimentary syndrome

: Diarrhœa

Treat: (1) Treat the cause

(2) Sedatives

(3) Symptomatic

(3) DELIRIUM TREMENS

Predisp: Chronic alcoholism

Exciting: (1) Severe trauma

(2) Operation

(3) Hospitalisation.

: Deprivation of usual dose of alcohol

Cause: Sudden withdrawal of alcohol from an individual who for a long time has been accustomed to its regular use.

Clinic: (1) Latency : upto 3 days

↓ (2) Prodromal syndrome :

- (a) **Insomnia**
- (b) Restlessness
- (c) **Incoherent talkativeness**
- (d) **Tremors** and twitchings
- (e) Anorexia
- (f) Toxæmia

↓ (3) Active stage : sthenic

- (a) Restlessness
- (b) Incoherence
- (c) **Hallucinations :**
 - (α) Sight
 - (β) Hearing
 - (γ) Persecution
- (d) **Insensibility to pain**
- (e) Toxic exhaustion

↓ (4) Stage of exhaustion : asthenic
: Typhoid state

Compl. (a) Delusional insanity
(b) Dementia

Treat: (1) Allow a small regular quantity of alcohol

(2) Purge and laxative

(3) Sedative:

: Paraldehyde, bromide, chloral

(a) R. Chloral hydras } \overline{aa} grs. xv
Pot bromide }

(b) R. Pot. bromide grs. xxx

Chloral hydras grs. xx

Tr. hyoscyamus m. xxx

Aqua menthæ pip. qs. ad. ounce I

(c) R. Veronal grs. x every 2 hours

(d) R. Hyoscine hydrobrom. 1/100 gr.

(4) Mechanical restraint :

(a) Plasters for fractures

(b) Quiet room

(c) Preliminary hot bath or cold pack

(d) Rest in bed

(e) Nourishing food

(4) **NERVOUS TRAUMATIC DELIRIUM**

: (See under Trauma to Head)

(5) **PSYCHOGENIC DELIRIUM :**

Etio: Hypochondriasis, hysteria.

CHAPTER V

SURGICAL PYREXIA

(I) ASEPTIC TRAUMATIC FEVER:

- Etio :** (1) Undrained operation or trauma
 (2) Extravasation of blood

- Predisp :** (a) Contusions
 (b) Hæmatomas
 (c) Lacerations
 (d) Extravasations

Path . Absorption of fibrin ferment

- Clinic :** (a) Start within 24 hours
 (b) Pyrexia not above 100° F.
 (c) Normal within 72 hours

- Treat :** (1) Aperient
 (2) Suitable diet

(II) INFECTIVE FEVERS,

Def: Pyrexia caused by toxins of bacteria

Types : (A) *Infective traumatic fever :*

Syn Non specific septic fever

Types (a) **Toxic fever:**

- Clinic .** (1) Begins about 3rd day
 (2) Marked toxic pyrexia
 (3) Acutely inflamed wound

(b) **Septic intoxication :**

Etio Very severe sepsis

- Clinic .** (1) Sthenic
 High temperature

(2) Asthenic :
 : Cardiac failure

(c) **Chronic sepsis :**

Etio Undrainable infective focus

- Clinic** (a) Intermittent temperature
 (b) Toxic cachexia

Treat . Free drainage

(B) *Specific infectious fevers :*

Treat : Specific antisera

(C) *Toxæmia :*

Def: Circulation of toxins in blood

- Types :** (a) Microbic .
 (α) Non specific
 (β) Specific
 (b) Proteolytic

- (c) Focus of infection under tension
 (d) Ulceration into a blood vessel
- Bact (a) **Streptococcus**
 (b) **Staphylococcus**
 (c) **Pneumococcus**
 (d) **B. Coli**
 (e) **B. Pyocyaneus**
- Clinic (1) **Terminal septicæmia :**
 (a) Long continued infective toxæmia
 ↓ (b) High pyrexia with rigors
 With (a) **Hæmoly sis**
 (β) **Diarrhœa**
 (γ) **Uræmia**
 (δ) **Lung congestion**
 + (c) **Blood culture +**
- (2) **Temporary septicæmia :**
 (a) Pre existing suppurative focus
 ↓ (b) Inadequate drainage
 ↓ (c) Septic pyrexia
 + (d) **Blood culture +**
- (3) **Established or primary septicæmia :**
- Etio (a) *Virulent bacteria*
 (a) **Streptococci**
 (β) **Pneumococci**
 (b) *Trivial primary focus*
 (a) **Punctured wound**
 (β) **Closed focus under tension**
 (c) *Deficient resistance*
 (a) **Non specific**
 Diabetes, nephritis
 (β) **Specific**
- Clinic (1) *Sthenic type*
 (a) **Rigors**
 (b) **Sudden high pyrexia**
- (2) *Asthenic type*
 Cause **Overwhelming infection**
- Clinic (a) **Toxic shock**
 (b) **Toxic delirium**
- Diag (a) **Insignificant focus**
 (b) **Lymphangitis**
 (c) **Sepsis syndrome + +**
 (d) **Blood examination**
 (a) **Blood count**
 (β) **Blood culture**
- (4) **Chronic septicæmia :**
 Etio; **Chronic suppurative focus**

- Excit: (a) Obstructed drainage
 (b) Lack of rest
 Clinic: (a) Intermittent fever:
 : With rigors
 (b) Toxic cachexia

(F) *Pyæmia*.

Def: Circulation of *pus droplets* in blood, leading to metastatic abscesses

Types (1) *Acute pyæmia*:

- Etio. (a) Acute suppurative osteomyelitis
 (b) Sinus thrombo phlebitis
 (c) Sinusitis
 (d) Abscess under tension

- Bact: (a) *Staphylococcus*
 (b) *Streptococcus*
 (c) *Pneumococcus*

- Path (a) Primary focus
 ↓ (b) Infected thrombus
 ↓ (c) Septic embolism
 ↓ (d) *Metastatic abscesses*:
 (1) Serous cavities
 (2) Joints
 (3) *Muscles*
 (4) *Areolar tissues*
 (5) Lungs

- Clinic (a) Primary suppurative focus
 + (b) Toxæmia
 ↓ (c) Rise in pyrexia:
 : With or without rigors
 + (d) Insidious appearance of abscess:
 (a) Subcutaneous tissues
 (β) Intermuscular planes
 (γ) Joints
 (δ) Pleuræ and lungs
 + (e) Pronounced toxæmia

(2) *Chronic pyæmia*:

Etio: Primary focus in

- (a) Teeth: pyorrhœa alveolaris
 (b) Tonsils: septic tonsillitis
 (c) Nasal sinuses sinusitis
 (d) Middle ear: otitis media
 (e) Anal canal: cryptit

- Clinic: (a) Rigor → pyrexia
 (b) Multiple succeeding
 (a) Subcutaneous
 (β) Intermuscular

(3) Portal pyæmia :

Etio Alimentary canal focus :

- (a) Acute appendicitis
- (b) Inflamed piles

Path : (a) Primary focus

↓ (b) Thrombo phlebitis

↓ (c) Pylephlebitis

↓ (d) Portal pyæmia

Clinic. (a) Primary focus. alimentary

(b) *Septic fever. with rigors,*

(c) Tender enlargement of liver

(d) Jaundice

(e) Toxic anæmia + cachexia

(G) Amyloid or lardaceous disease :

Syn Waxy disease

Def : Deposition of amyloisin or lardacein :

: Around the blood vessels of viscera

Etio Chronic suppurative focus :

(a) Bone

(b) Joint

(c) Thorax

Path Deposition of amyloisin or lardacein in the walls of arterioles, which stains mahogany brown with iodine and causes smooth enlargement of kidneys, liver, spleen and intestines.

Clinic (1) Kidneys polyuria, albuminuria, enlargement

(2) Intestines diarrhoea

(3) Liver smooth enlargement

(4) Spleen smooth enlargement

(5) General *toxæmia and cachexia*

Treat (a) Treat the original focus

(b) General hygiene

Blood examination in septic pyrexias :**(A) Microscopical : Leucocytosis**

(a) Total

(α) Inflammation 8,000-15,000

(β) Suppuration Above 20,000

(b) Polymorphs

Above 85% in suppuration

(c) Lymphocytosis :

: Chronic granulomas

(d) Eosinophilia :

: Animal parasitic infection

(B) Cultural**Treatment in septic pyrexias :**

(1) Treat the local condition ;

(a) Excision in toto

- (b) Drainage
- (c) *Ligature of efferent vein : prophylactic*

(2) **General :**

- (a) Specific : antisera, vaccines
- (b) Non specific : chemo therapy
- (c) Supportive hydrotherapy,^o glucose,
: blood transfusions

(III) **CENTRAL NERVOUS FEVERS :**

Etio : Cerebral trauma or operation

Cause : Pontine hæmorrhage

Clinic : (a) Hyperpyrexia

+ (b) Pin point pupils

Path : Interference with thermogenic centres

Treat : (1) Conservative .

: Tepid or ice packs.

CHAPTER VI

JAUNDICE AND CHOLÆMIA

(1) OBSTRUCTIVE HEPATIC JAUNDICE:

: Immediate *direct* Van den Bergh

Signs: (a) **Bile-staining** of all tissues:

- (1) **Yellow**
- ↓ (2) **Orange**
- ↓ (3) **Olive**
- ↓ (4) **Green**
- ↓ (5) **Gray**
- ↓ (6) **Black**

(b) **Urine: Bile pigments and salts**

(c) **Acholic stools:** Pale, bulky, offensive

(d) **Nervous syndrome:**

- (α) **Pruritus**
- (β) **Irritability**
- (γ) **Drowsiness**

(e) **Blood and circulation:**

- (α) **Slow pulse**
- (β) **Greater resistance of R. B. C.s to hypo saline**
- (γ) **Prolongation of coagulation time**

(f) **Enlarged liver**

Diag: Immediate *direct* Van den Bergh

Causes: *Obstruction to biliary ducts:*

(A) *Lumen:*

- (1) **Biliary mud:** Catarrhal jaundice
- (2) **Gall stone**
- (3) **Round worm or liver fluke**

(B) *Duct wall:*

- (1) **Cholangitis:** Catarrhal jaundice
- (2) **Stenosis**
- (3) **Carcinoma**

(C) *External pressure:*

- (1) **Chronic pancreatitis**
- (2) **Carcinoma:**
 - (a) **Pancreas**
 - (b) **Gall bladder**
 - (c) **Pylorus**
 - (d) **Kidney**
 - (e) **Liver**

(3) **Enlarged portal glands:**

- (a) **Malignant**

- (b) Leukæmic
- (c) Lymphadenomatous
- (d) Tuberculous

- (4) Adhesions
- (5) Mobile kidney . kinked duct

Clinic (A) **Gall stone jaundice :**

- (a) Type of patient
- (b) Gall bladder dyspepsia
- (c) Recurrent biliary colic
- (d) Intermittent hepatic fever
- (e) *Gall bladder not palpable*
- (f) *Jaundice* : (a) *Intermittent*
(β) *Fluctuating*
- (g) X Rays

(B) **Malignancy jaundice :**

- (a) *Jaundice* :
 - (1) *Persistent*
 - (2) *Progressive*
 - (3) *Ingravescent*
 - (4) *Painless*
 - (5) *Intense*
- (b) Rapid progressive wasting
- (c) *Gall bladder enlarged*
- (d) Liver enlarged
- (e) Stools
 - (1) Absence of bile
 - (2) Absence of pancreatic digestion

(2) **HÆMOLYTIC JAUNDICE . Indirect Van den Bergh**

- Path : (a) Excessive blood destruction
 ↓ (b) Excessive retention of bilirubin

Causes : (1) **Acholic familial jaundice :**

: (See page 1476)

- (2) **Pernicious anæmia**
- (3) **Icterus neonatorum**
- (4) **Excessive hæmolysis :**
 - (a) Septicæmia
 - (b) Erroneous transfusion

(3) **TOXIC OR INFECTIVE HEPATIC JAUNDICE :**

: *Biphasic* Van den Bergh

Causes : (a) **Catarrhal jaundice :**

Syn : Infective hepatitis and cholangitis

- Clinic : (1) Vague gastro intestinal symptoms
- (2) Pyrexia
 - (3) Slight jaundice :
 - (a) Pruritus
 - (b) Bradycardia

- (c) Stools
 - (a) Pale
 - (β) Offensive
 - (γ) Bile pigment
- (4) Tender enlargement of liver
- (5) *Duration not more than 6 weeks*
- (b) **Infective illnesses :**
 - (a) Typhoid
 - (β) Pneumonia
 - (γ) Septicæmia
 - (δ) Eclampsia
- (c) **Syphilis :** Congenital and acquired
- (d) **Arsenobenzol poisoning**
- (e) **Delayed Chloroform poisoning**

Summary of causes of jaundice :

(1) *Obstructive or surgical jaundice :*

- (A) *Within the lumen*
 - (a) **Inspissated bile**
 - (b) **Gall stones**
 - (c) **Parasites**
- (B) *Walls of the ducts*
 - (a) **Catarrh :**
 - (a) Duct walls
 - (β) Ampulla of Vater
 - (γ) Pancreas
 - (b) **Carcinoma**
 - (c) **Cicatrization**
 - (d) **Congenital**
- (C) *Pressure from outside*
 - (a) **Peritoneal adhesions**
 - (b) **Enlarged portal glands**
 - (c) **New growths of :**
 - (1) **Liver**
 - (2) **Pancreas**
 - (3) **Gall bladder**
 - (4) **Duodenum**
 - (5) **Stomach**
 - (6) **Colon**
 - (7) **Right kidney**
 - (8) **Omentum**
 - (d) **Hepatic arterial aneurysm**
 - (e) **Chronic pancreatitis**
 - (f) **Retro peritoneal abscess or cyst or tumour :**
 - (a) **Perinephric**
 - (β) **Subphrenic**
- (D) *Traction and kinking :*
 - : Visceroptosis .**
 - (a) **Mobile kidney**
 - (b) **Mobile duodenum**

(II) *Non obstructive or medical jaundice :*(A) *Diseases of the liver :*

- (1) Congestion
- (2) **Cirrhosis**
- (3) Carcinoma
- (4) **Acute yellow atrophy**
- (5) Syphilis
- (6) Abscess

(B) *Acute fevers and infections :*

- (1) Malaria
- (2) Typhoid
- (3) Influenza
- (4) Pneumonia
- (5) Tropical fevers
- (6) Septicæmia or pyæmia

(C) *Poisons*

- (1) **Chloroform**
- (2) **Arseno benzol**
- (3) Phosphorus
- (4) Snake poison

(D) *Blood diseases*

- (1) Icterus neonatorum
- (2) Acholuric jaundice
- (3) Familial jaundice
- (4) Pernicious anæmia
- (5) Splenic anæmia
- (6) Leukæmia
- (7) Lymphadenoma
- (8) Paroxysmal hæmoglobinuria

(E) *Nervous :*

: Concussion

Diagnostic methods in jaundice :(1) **Careful history :**

- (a) Age
- (b) Pregnancy
- (c) Chemicals
- (d) Family history

(2) **Symptomatology :**

- (a) Dyspepsia and pain
- (b) Jaundice
- (c) Fever

(3) **Physical examination :**

- (a) Liver
- (b) Gall bladder
- (c) Spleen
- (d) Pancreas head
- (e) Stomach and duodenum

- (f) Peritoneum
- (g) Rectum
- (4) **X-Rays** :
Plain X Rays , no cholecystography
- (5) **Stools** :
(a) Naked eye colour, smell, bulk
(b) Pancreatic deficiency
(c) Biliary deficiency
(d) Blood
(e) Cysts or vegetative forms of *E. Histolytica*
- (6) **Urine** :
Bile pigments and salts
- (7) **Blood** ,
(a) Blood count total and differential
(b) Wassermann or Kahn
(c) Van den Bergh
(d) R B Cs. fragility
(e) Icteric index
(f) Coagulation time
(g) Bleeding time

*Factors in differential diagnosis of causes of jaundice **

(I) **Age, sex and history :**

(A) **Age**

- (a) New born icterus neonatorum
- (b) Infants (a) Familial acholuric
(β) Syphilis
- (c) Before 30 catarrhal
- (d) After 30 gall stones
- (e) After 40 carcinoma

(B). **Sex**

- Females (a) Gall stones
(b) Pregnancy liver necrosis

(C) **History of arsenicals**

(2) **Colour :**

- (A) **Hæmolytic** (a) Lemon yellow
(b) Conjunctiva unaffected
- (B) **Hepatic necrosis** bright yellow
- (C) **Obstructive** (a) Dirty yellow
(b) Greenish yellow

(3) **Course :**

- (A) **Short duration** (a) Catarrhal
(b) Passing gall stone
- (B) **Progressive** (a) Carcinoma
(b) Chronic pancreatitis
- (C) **Intermittent** : gall stones

(4) Gall bladder :

- (A) Jaundice + gall bladder enlarged :
: Carcinoma or chronic pancreatitis
- (B) Jaundice + gall bladder not enlarged :
: Stones in ducts
- (C) Gall bladder enlarged + no jaundice :
: Stones in gall bladder or cystic duct

(5) Liver enlargement :

- (A) Irregular growth, cirrhosis
- (B) Smooth obstruction to duct, congestion

(6) Stools :

- (A) White obstructive jaundice
- (B) Yellow hæmolytic or toxic jaundice

(7) Pain :

- (A) Constant growth
- (B) Attacks stone colic
- (C) Absence toxic or catarrhal or growth

(8) Syphilis :

- (A) Disease proper
- (B) Arseno benzol treatment

CHOLÆMIA OR HEPATIC FAILURE :

Cause. Loss of detoxifying function of the liver cells for amino acids

Etiology: Unrelieved chronic obstructive jaundice

Path. Fatty degeneration + necrosis + hæmorrhage

- Clinic:** (a) Onset acute or insidious
 (b) Neuro muscular syndrome
 (c) 'Typhoid state' toxæmia
 (d) Jaundice
 (e) Hyperpyrexia
 (f) Intractable vomiting
 : With hæmatemesis
 (g) Hæmorrhages

Types. (1) Medical cholæmia

(2) Post-operative cholæmia :

Cause: Hepatic inadequacy due to :

- (a) Deranged liver
- + (b) Effects of :
 - (1) Anæsthesia
 - (2) Trauma
 - (3) Shock
 - (4) Hæmorrhage
 - (5) Toxæmia
 - (6) Starvation & dehydration

- Clinic:** (1) Rapid death : within 48 hours
 (2) Delayed death : within 4 or 5 days
 (3) Renal death : cholæmia + anuria

Clinic synd · (1) Liver acidosis :

- Clinic (a) Vomiting
 (b) Prostration
 (c) Air hunger + hay smell
 (d) Acetonuria

(2) Primary liver failure :

- Syn White bile
 Clinic (a) Vomiting
 (b) Prostration + weakness
 (c) Restlessness
 (d) Thin white bile

(3) Secondary renal failure :

- Clinic (a) Bile less
 (b) Jaundice more
 (c) Circulatory failure
 (d) Drowsiness → coma
 (e) Blood urea rise

Liver function tests**(A) Blood****(1) Van den Bergh ·**

Test for bilirubin by diazo reagent

- (a) Direct (α) Immediate obstructive
 (β) Delayed
 (γ) Biphasic infective
 (b) Indirect hæmolytic

(2) Fouchet

Ferric chloride + trichloroacetic acid

(3) Icterus index :

· Plasma against potassium bichromate

(B) Urine**(1) Bile salts and pigments**

- (2) Nitrogen coefficient
 (3) Ammonia coefficient

(C) Stools

· For bile and pancreatic ferments

(D) Lævulose tolerance test**(E) Galactose tolerance test :**

- (1) Infective jaundice :
 (a) Galactosuria
 + (b) Hyper glycaemia
 (2) Hæmolytic or obstructive jaundice ·
 No hyper glycaemia or galactosuria

(F) Intravenous

- (a) Phenol tetra chlor phthalein
 or (b) Brom sulphalein
 ↓ Examine. (a) Stools
 (b) Duodenal contents
 (c) Blood

(G) *Cholecystography* : dangerous in jaundice

(H) *Duodenal intubation* : Meltzer-Lyon test

Treatment of jaundice :

(I) *Medical treatment :*

(1) **Rest in bed**

(2) **Diet :**

(a) Plenty of carbohydrates : glucose, cane sugar

(b) Plenty of fluids

(c) No fats

(3) **Bowels :**

(a) Calomel : $\frac{1}{2}$ — $\frac{1}{4}$ gr. hourly for 6 doses

↓ (b) Saline purge : 12 hours after

(c) Mag. sulph : Drachms 2 every morning

(d) Ice cold enema

(e) Direct trans duodenal biliary drainage :
: By Einhorn tube

(4) **Cholagogues and biliary antiseptics :**

(a) Hexamine grs 30

Helmitol grs. 15

Felamine

(b) Calomel ; pil. hydrargyri

(c) Belladonna

(d) Alkalies

(5) **Symptomatic :**

(A) Gastric irritation :

: R Bismuth salicylas grs. xv

Soda bi-carb grs. xv

Tr. belladonna m. v

Acid hydrocyanic dil. m. iii

Tr. auranti m. xx

Aqua chloroformi ad. ounce 1

every four hours

(B) **Cholangitis :**

(a) Local fomentations

+ (b) Subcutaneous injections :

(a) Atropine sulph. 1/100 gr.

+ (β) Adrenaline hydrochlor. 5 min.

(C) **Pruritus :**

(a) Alkalies by mouth

(b) Alkaline bath

(c) Calamine ointment

(d) Thyroid extract

(e) Sedatives

(6) **Cholæmia :**

(A) **Glucose-insulin :**

(a) 5-10% glucose-saline : any route

CHAPTER VII

DIABETES IN SURGERY

- Etio:** (1) Age above 40
 (2) Well-to do class
 (3) Faulty diet
 (4) Secondary to ductless glands

Path: *Effects of diabetes on surgery:*

- (1) *Susceptibility to infection:*
 (a) **Skin infections:**
 : Eczema, dermatitis
 (b) *Boils and carbuncles:* (See under Skin)
 (c) Pyogenic abscesses
 (d) Cellulitis: (See under Skin)
 (e) Pyæmia and septicæmia
 (f) *Gangrene.*

Def: Gangrene in a diabetic patient

Etio: Any trauma, even slight

Site: **Lower extremity:** toes → foot → leg

- Path:** (a) Arterio sclerosis
 (b) Peripheral neuritis
 (c) Lowered tissue vitality
 (d) Focal sepsis

- Clinic.** (1) Dry, aseptic gangrene
 or (2) **Septic, moist gangrene:**
 (a) Marked inflammation
 (b) Rapid progress
 (c) Rapid extension
 + (3) Septic intoxication
 + (4) Glycosuria + glycæmia

- Compl.** (a) Diabetic coma
 (b) Septic intoxication
 (c) Exhaustion
 (d) *Lung complications:*
 (α) Broncho pneumonia
 (β) Embolism
 (e) Cardio vascular sclerosis

Treat: (A) **Conservative:**

- Ind: (a) Localised dry gangrene
 (b) Non spreading infection
 (c) No intense pain
 (d) No high temperature

(B) **Operative:**

- Ind: (a) Spreading infection

(b) No improvement :

. After 3 weeks

(c) Prolonged pain

(d) Septicæmia

(e) Exhaustion

Prep. (1) Glucose

(2) Insulin

(3) Soda bi carb

Oper Amputation

Site. (a) Well above the knee

(b) Well clear of sepsis

Tech. (1) One stage

(2) Two stages

(A) { (a) Femoral sympathectomy
(b) Femoral vein ligature

↓ (B) Low amputation

(2) *Delayed healing :*

Causes: (a) Susceptibility to infection

(b) Low regenerating power

(a) Arteriosclerosis

(β) Peripheral neuritis

(3) *Effects of surgery :*

Factors: (A) Anæsthesia

(B) Cardio-vascular changes

(C) Operative trauma

Effects: (A) Local spread of sepsis

(B) Septic toxæmia

(C) Acidosis and diabetic coma :

Etio. (a) Dehydration

(b) Dietary infraction

(c) Omission of insulin

(d) Infection

(e) Anæsthesia

(f) Operative trauma

Clinic. (See under Acidosis)

Management of surgical diseases in diabetes :

(I) **CHRONIC CASES :**

(A) *Pre operative treatment :*

(a) **Investigations :**

(1) Urine analysis.

(a) Sugar

(β) Aceto acetic acid and acetone

(2) Blood sugar estimation

(3) Blood pressure

(b) **Diet and insulin :**

(1) Liberal allowance of carbohydrates :

(a) Milk

- (β) Juice of : (1) **3 or 4 oranges**
 (2) **1 or 2 grape fruits**
 (3) **1 or 2 bananas**
- (2) **Insulin** : Units as required
- (3) **Plenty of fluids** :
 (α) Oral
 6 ounces of water or broth or coffee
 or milk or orange juice every hour
- (β) Rectal
 (1) 5% glucose } 6 ounces at a
 (2) Tap water } time
- (B) *Just before the operation*
 (a) **25 units of insulin** : subcutaneous
 ↓ (b) **50 gms. of glucose** : intravenous
- (C) *Operative precautions*
 • : **Anæsthesia** :
 Give (1) Spinal
 (2) **Regional** or local
 (3) Gas and oxygen
 (4) Avertin
 (5) **Sodium evipan**
 (6) **Cyclopropane**
- Avoid (a) *Chloroform*
 (b) *Ether*
- (D) *Post operative treatment* .
 (a) **Hydrotherapy** :
 Mouth, rectum, veins
- (b) **Glucose + insulin** :
 2 gms of glucose to 1 unit of insulin
 Veins, mouth, rectum
- (c) **Diet** :
 Milk + orange juice + banana
- (d) **Keep a watch for coma**

(II) ACUTE CASES

- (A) *Pre operative treatment*
 (a) **Investigations** :
 (α) Urine
 (β) Blood
 (γ) Blood pressure
- (b) **Diet and insulin** :
 (a) **Plenty of fluids** .
 • By all available routes
 (β) **100 gms. glucose + 50 units insulin**
- (B) *Operative precautions* :
 (a) **Avoid general anæsthesia**
 (b) **Prevent shock**

(C) Post operative treatment :**(a) Investigations :**

- (1) **Urine analysis : every three hours**
- (2) **Blood sugar estimation**

(b) Diet and insulin :: **Milk + glucose + insulin :**

- (a) **2 gms glucose to 1 unit insulin :**
- Every 4—6—8 hours**
- : Till urine is sugar free**

↓ **(β) Sugar alone orange juice ounce $\frac{1}{2}$** **(c) Plenty of fluids :**: **By all available routes****(III) COMPLICATIONS****(A) Diabetic coma****Treat : (1) Purge : Calomel or castor oil****(2) Soda-bi-carb :**

- (a) **One teaspoonful in 5 ounces of water .**
- Every hour by mouth**
- : Till urine is alkaline**

(b) Infusion of 2-3 pints of 3% solution**(3) Keep warm****(4) Insulin :**: **50-100 units subcutaneous straight****(5) 2 ounces dextrose + 50 units insulin**↓ **(6) Examine urine for sugar every 3 hours**↓ **(7) If 6th hour urine contains sugar :**
: **Give pure insulin 30-50 units****or (7) If 6th hour urine contains no sugar .**
: **Give 2 gms. glucose to 1 unit insulin****(8) Hydrotherapy :****(a) Graf wafer 10 ounces per hour****(b) 600 c cs normal saline every 3 hours****(c) 20% glucose every 3 hours****Prognosis : (a) Age of the patient : worse after 40****(b) Degree of coma****(c) Presence of infection****(B) Hypoglycæmia :****Clinic : (a) Prostration and nervousness**↓ **(b) Collapse**↓ **(c) Delirium**↓ **(d) Convulsions**↓ **(e) Coma**

Diff. diag :

<i>Clinic</i>	<i>Diabetic</i>	<i>Hypoglycæmic</i>
Onset	gradual	sudden
Skin	flushed, blue, dry	white, sweating
Tongue	dry	moist
Breath	acetone smell	no smell
Respirations	deep	shallow
Pulse	rapid, feeble	bounding
Eye tension	low	normal, raised
Urine	sugar + acetone	no sugar or acetone
Blood sugar	over 200 mgm.	below 70 mgm.
Blood pressure	low	normal

- Treat : (1) *Stop insulin*
 (2) *Orange juice 2-4 ounces by mouth*
 (3) *Glucose : by all available routes*
 (4) *Injections.*
 (a) *Adrenaline . 1 c.c. subcutaneous*
 (b) *Pituitrin : 1 c.c. intramuscular*

CHAPTER VIII

ANURIC URÆMIA

Def : Retention of urea and nitrogenous products in blood,
due to their defective excretion by the kidneys

Etio : (1) **Shock or acidosis**

(2) **Hepatic failure**

(3) **Reflex anuria :**

(a) Urethra : instrumentation

(b) Bladder . lithotomies

(c) Ureter . impacted stone

(d) Kidney . inflammation

(4) **Infective anuria :**

(a) Hæmatogenous .

(a) Toxic . pneumonia, typhoid

(β) Bacterial . septicæmia

(b) *Ascending urinary sepsis :*

(a) *Primary*

(β) *Post operative*

(5) **Urinary back pressure :**

(a) **Urinary obstruction :**

(a) Gradual . prostatism

(β) Sudden . impacted stone

(b) *Sudden relief of obstruction :*

. With sudden decompression

(6) **Kidney destruction anuria :**

(a) Gradual . hydro or pyo nephrosis

(b) *Removal of only functioning kidney*

Path . (1) **Rise in blood urea :**

: (Normal between 20 → 35 mgm. per 100 c.c.s.)

(2) **Acidosis**

(3) **Inefficient kidneys**

Clinic . (1) **Urinary .**

(a) **Primary urinary focus**

(b) Oliguria, anuria or polyuria

(2) **Circulatory :**

(a) **High blood-pressure**

(b) Bradycardia

(c) Arterio sclerosis

(3) **Cerebral :**

(a) **Headache**

(b) Twitchings → convulsions

- (c) **Drowsiness** → coma
- (d) **Retinitis** → amaurosis
- (e) **Local paræsthesia** or palsies
- (f) **Mania** or delusional insanity

(4) *Respiratory*

- (a) **Dyspnoea**
Paroxysmal and hissing
- (b) **Hiccough**

(5) *Gastro intestinal*

- (a) **Nausea** and vomiting
- (b) **Thirst** and dry tongue
- (c) **Diarrhœa**
- (d) **Dyspepsia** and anorexia
- (e) **Tympanitis** → **paralytic ileus**

Signs *Of kidney inefficiency* (See page 1584)

- (1) **Indigocarmine test**
- (2) **Phenol sulphonphthalein test**
- (3) **Urea concentration test**
- (4) **Blood urea estimation**
- (5) **Diastase test**
- (6) **Intravenous pyelography**

Treat (1) **Purgation :**

- (a) **Mag sulph** drachm $\frac{1}{2}$ -1
- (b) **Pul jalap co** drachm 1-1 $\frac{1}{2}$
- (c) **Mist sennæ co** ounce 1

(2) **Diaphoretic :**

- (a) **Hot packs**
- (b) **Pilocarpine** 1/60 gr

(3) **Diuretics :**

- (a) **Tap water** : Oral and rectal
- (b) **Normal saline** . Rectal, subcut, venous
- (c) **Glucose** Oral, rectal, venous
- (d) **Isotonic sodium sulphate** : venous
42.85 gms of Glauber salt in 1 litre of water
- (e) **Diuretic mixture** : Oral

R Pot acetat grs x
Pot citras grs x
Spt etheris nitrosi m xxx
Inf buchū ad ounce i

(4) **Urinary drainage : Gradual decompression**

- (a) **Urethral catheter**
- (b) **Ureteral catheter**
- (c) **Suprapubic cystostomy**
- (d) **Nephrostomy**

(5) **Peritoneal lavage**(6) **Renal decapsulation**

IMPORTANT POINTS

- (1) *Acidosis should be suspected when vomiting, for which there is no apparent reason, continues for more than 48 hours after operation, with characteristic odour of new mown hay to the breath*
- (2) *Diagnosis in acidosis and alkalosis*
 - (a) *H ion concentration of blood*
 - (b) *Alkali reserve of blood*
 - (c) *Alveolar Co.*
 - (d) *Reaction of freshly passed urine*
 - (e) *Aceto acetic acid in urine*
 - (f) *Amount of soda bi carb to make urine alkaline*
Normal 5 gms
- (3) *Shock is a clinical term applied to a condition of general depression of vital functions caused by ischæmia due to lowered blood pressure, brought about by capillary and venous stasis or hæmorrhage, and with a clinical syndrome of circulatory depression as shown by*
 - (a) *Running pulse*
 - (b) *Subnormal temperature*
 - (c) *Mental apathy*
- (4) *Blood pressure provides an index of the degree of shock*
- (5) *Shock is due to a deficiency in the volume of circulating blood, brought about by an enormous distension of capillary bed throughout the body, caused by histamine produced in the damaged tissues and entering the blood stream, or by actual loss of blood in hæmorrhage.*
- (6) *Surgical shock can be defined as a state of circulatory failure or depression consequent upon direct injury to body tissues*
- (7) *Loss of fluid hæmorrhage and nociceptive centripetal impulses from the damaged area are important factors in traumatic shock*
- (8) *Vocal anæsthesia is of extreme importance in association with local or spinal anæsthesia, a helpful and reassuring conversation on the part of the surgeon is of great value in reducing shock*
- (9) *For intravenous infusion, compatible blood is the best fluid for use in most cases of shock, but saline and sugar solutions are also of value*
- (10) *Warmth + morphia + blood transfusion is a great anti shock triad*
- (11) *Treat a fall in blood pressure during the course of an operation, by covering the wound with hot clothes and waiting until a rising blood pressure indicates recovery, before proceeding further.*

- (12) Rise of temperature after brain injury is a grave prognostic sign
- (13) *Few, if any, cases of obstructive jaundice with a hold on life, should be abandoned as hopeless without exploration*
- (14) *Yellow sclerotics denote obstructive jaundice, the outstanding causes of which are, cholangitis, gall stones and carcinoma*
- (15) Complications of impaction of a gall stone in the duct
 - (a) White bile with hepatic failure
 - (b) Acute suppurative infection
 - (α) Cholangitis Charcot's hepatic fever
 - (β) Hepatitis hepatic abscesses
 - (γ) Cholecystitis empyema, gangrene
 - (c) Suppurative pylephlebitis
 - (d) Perforation → local peritonitis
 - (e) Internal fistulae → intestinal obstruction
 - (f) Cicatricial stenosis of the duct
 - (g) Pancreatitis acute or chronic.
- (16) *Cholecystography should not be done in the presence of jaundice*
- (17) *If jaundice persists more than six weeks, it is more than catarrhal*
- (18) The first thing to decide in jaundice is whether it is medical or surgical
- (19) When jaundice is not deep, the question of early operation does not arise, operate within 24-48 hours if
 - (a) Progressive
 - (b) Painless
 - (c) Olive hue
- (20) Jaundice classification
 - (A) Obstructive
 - (a) Lumen
 - (b) Wall
 - (c) Outside
 - (B) Non obstructive
 - (a) Liver
 - (b) Blood
 - (c) Infective
 - (d) Poisons
 - (e) Nervous.
- (21) Chief complications of jaundice
 - (a) Hæmorrhage
 - (b) Acidosis
 - (c) Cholæmia
 - (d) Intestinal or gastric ileus
- (22) Cholæmia
 - (1) Hepatic strain
 - + (2) Fever + vomiting + anuria + nervous symptoms

- (23) In obstructive jaundice operation
 (a) Primary object
 Relief of obstruction by proximal drainage
 ↓ (b) Secondary object
 Removal of the cause of obstruction
- (24) *Do not be in a hurry to operate on jaundice, at the same time, do not leave it too long either*
- (25) *In jaundice, chief point in the operation is the drainage of bile through proximal drain, if drainage is not copious or even present, it means proximal obstruction, liver failure or reflex traumatic inhibition*
- (26) White bile
 (a) Hepatic failure
 or (b) Isolated gall bladder
- (27) *Bugbears in jaundice*
 (a) *Hæmorrhage*
 (b) *Acidosis*
 (c) *Cholangitis*
 (d) *Liver death primary and renal*
 (e) *Ileus gastric or intestinal*
- (28) Different jaundice syndrome
 (a) Stone jaundice fluctuating intensity
 (b) Carcinoma jaundice relentlessly progressive
- (29) Acholuric jaundice
 (a) Jaundice
 (b) Cholecystitis
 (c) Enlarged spleen
 (d) Young slim patient
- (30) *Hæmorrhage, renal inefficiency and infection of the ducts are the most common causes of death following operations upon the gall bladder and biliary passages*
- (31) *Calcium, glucose + insulin and avoidance of chloroform are sheet anchors in jaundiced people*
- (32) The bleeding tendency manifests itself 3 or 4 days after operations for jaundice.
- (33) *Bleeding tendency in jaundice is due essentially to a deficiency of prothrombin*
- (34) *For deficient coagulation time*
 (A) *Intravenous*
 (1) *Calcium gluconate 10%, 10 c.cs*
 (2) *Calcium chloride 10%, 10 c.cs*
 (3) *Blood transfusion*
 (B) *Intramuscular*
 (1) *Calcium gluconate 10%, 10 c.cs.*
 (2) *Sodium citrate . 30%, 30 c.cs*

- (58) *It is better to divide the insulin into frequent small doses (15 units) when large doses are to be given*
- (59) *A diabetic coma or acidosis may present clinical syndrome which may simulate appendicitis, cholecystitis or peptic perforation*
- (60) *The amount of insulin necessary to keep a post operative diabetic sugar free and ketone free may vary from 0 to 100 units every few hours*
- (61) *Amputation in diabetic gangrene*
 - (a) *Amputate through clearly healthy tissues*
 - (b) *Employ equal flaps*
 - (c) *Leave the wound open*
 - (d) *Prophylactic anti gas gangrene*
 - (e) *Use spinal or epidural anaesthesia*
- (62) *Acute abdomen should not be postponed even in the presence of acidosis or coma*
- (63) *Ratio of glucose to insulin should be 2 gms to 1 unit*
- (64) *An abundant carbohydrate allowance in the ante operative diet prepares the diabetic for the drain on the glycogen reserve during the post operative period and also brings about complete combustion of fats and prevents ketosis*
- (65) *Whatever kind of diet selected, if glycosuria persists, it should be abolished by giving insulin*
- (66) *Before giving insulin to a diabetic, urine analysis should be made without fail, every time*
- (67) *Intravenous administration of glucose 250 ccs of 10% sol with 20 to 25 units of insulin, is a valuable pre-operative measure in diabetes*
- (68) *Starvation diets must have no place in the pre operative treatment of surgical diabetics, but a diet rich in carbohydrates and low in fats and proteins should be allowed*
- (69) *Adrenaline and pituitrin neutralize insulin*
- (70) *Hypoglycaemia = shock + nervous symptoms.*
- (71) *1 Pint of milk = 28 gms of glucose = 14 units of insulin*
- (72) *Beyond the age of 50, people with diabetes have pathological changes in heart, blood vessels and kidneys*
- (73) *Clinical acidosis will not develop if sufficient glucose is oxidised, insulin is not a sufficient protection unless glucose be administered with it*
- (74) *Before an emergency operation in diabetes, to counteract marked glycosuria and acidosis, the best and quickest method is to give an intravenous injection of 20 ccs of 50% glucose and about 20 to 30 units of insulin, repeat if acidosis develops after operation*

- (75) *It is useless to attempt to reduce patient's glycosuria in the presence of undrained infection*
- (76) *When gangrene involves foot or lower leg, amputate well above the knee, to amputate directly above the gangrenous area is a mistake in diabetes*
- (77) Complications of insulin therapy
 (a) Insulin allergy
 Treat Histamine phosphate 3 times a week
 0.1 mgm → 1 mgm upto 12 mgm
 (b) Insulin resistance
 (c) Hypoglycaemia -
- (78) Emotional states must be avoided at meal times by all diabetics
- (79) Elevated blood sugar impairs patient's power of resistance.
- (80) Infection tends to elevate the blood sugar content and to precipitate coma
- (81) Infection plays an important part in upsetting the sugar tolerance of an otherwise controlled case of diabetes
- (82) *Never treat too lightly even a trivial infection in diabetics*
- (83) Diabetics past the age of 40 complaining of even vague and indefinite digestive symptoms should have the gall bladder thoroughly investigated
- (84) Diaphoretics are useless and even harmful in uraemia, what the patient requires is a diuretic
- (85) *Never starve a diabetic for a long time before operation*
- (86) *Emergency operation on a diabetic with acidosis or coma*
 (A) (a) 50 units of insulin subcutaneous
 (b) 50 ccs of 50% glucose + 50 units insulin
 Intravenous
 Repeat every hour till urine is ketone free
 (B) Oral, rectal, subcutaneous fluids
 3000 ccs in 24 hours
 If there is no actual coma
 20 ccs of 50% glucose + 20 units insulin
 Intravenous
- (87) *Drainage and excision of infected tissues are of primary importance, without which it is useless to reduce glycosuria in diabetes in surgery*
- (88) *Diabetic coma sometimes comes on with dramatic suddenness, not a single day should pass without a conscientious examination of the urine for sugar and ketone bodies, in diabetics with infection or surgical intervention.*

- (89) *Infected corn or shoe-bite in an elderly patient : examine the urine for sugar.*
- (90) A diabetic must be under strict dietary surveillance during the whole course of any surgical treatment from the beginning to the end; and no indiscretion should be allowed especially in acute phase

CHAPTER IX

GANGRENE

Def : Death of the tissues en masse :

- (a) Necrosis death of bone or cartilage
- (b) Sloughing death of soft tissues
- (c) Gangrene : death of a part of body

Types : (1) **Dry gangrene :**

- Etio :** (a) Arrest of blood supply
 + (b) Efficient venous circulation
 + (c) Evaporation
 + (d) Relative asepsis

(2) **Moist gangrene :**

- Etio .** (a) Arrest of blood supply
 + (b) Obstruction to veins
 + (c) Moisture
 + (d) Relative sepsis

Path : (1) **Dry gangrene :**

- (a) Endarteritis, embolus or ligature
- ↓ (b) Dry death

(2) **Moist gangrene :**

(A) *Aseptic moist gangrene :*

- (a) Stasis of circulation
- ↓ (b) Thrombosis and hæmolysis
- ↓ (c) Signs of death

(B) *Septic moist gangrene .*

- (a) Moist gangrene
- + (b) Bacterial putrefaction :
 - (a) Nitrogenous products
 - (β) Non nitrogenous products

(3) **Line of separation :**

: Dead part, acting as an irritant, sets up in the proximal living tissues .

- (a) Inflammation
- ↓ (b) Ulceration
- ↓ (c) Line of demarcation

Clinic : (1) Change of colour

(2) Loss of sensations touch and pain

(3) Loss of heat

(4) Loss of pulsation

(5) Loss of function

(6) Sapræmia

(1) *Local :*

(A) **Dry gangrene :**

- (a) Paræsthesia → acute pain
- (b) Skin :

- (a) Waxy → greasy → transparent
 - ↓ (β) Yellow → brown → black
 - ↓ (γ) Shrivelled hard dry
- (c) Line of separation
 - (a) Ill defined
 - (β) Slow
 - (γ) Unstable
- (d) Living tissues
 - Inflammation not marked
- (B) Aseptic moist gangrene**
 - (a) Acute pain
 - (b) Skin
 - (a) Cold insensitive
 - (β) Blebs bullæ œdema
 - (γ) Mottling + dusky lines
 - (δ) Play of colours
 - (c) Line of separation
 - Rapid
 - (d) Living tissues
 - Inflammation not marked
- (C) Septic moist gangrene**
 - (a) Skin
 - (a) Wavy mottled multi coloured
 - (β) Slippery derms with bullæ
 - (γ) Crepitations
 - (δ) Foul odour
 - (b) Line of separation
 - (a) Rapid
 - (β) Well marked
 - (c) Living tissues
 - Inflammation well marked
- (2) Constitutional Sapræmia and exhaustion**
 - (A) Dry gangrene**
 - Sapræmia not marked
 - Chronic exhaustion due to pain
 - (B) Aseptic moist gangrene**
 - Sapræmia moderate
 - (C) Septic moist gangrene**
 - Sapræmia most marked
- (3) Indirect evidence**
 - (A) Examination of heart**
 - Endocarditis
 - (B) Examination of peripheral vessels**
 - Arterio sclerosis atheroma Buerger
 - (C) Peripheral or central nervous system**
 - (D) Metabolic diseases**
 - (a) Nephritis
 - (β) Diabetes

Treat* (1) **Promotion of asepsis :**

. Dressings

(2) **Promotion of dryness :**

(a) Relief of constriction

(b) Elevation

(c) Gentle massage

(d) Promotion of evaporation

(e) Timely incisions

(3) **Protection and rest :**

(a) Immobilisation in elevation

(b) Copious and extensive dressings

(4) **Mechanical treatment :**

(A) Expectant or conservative

Allow the natural separation

(B) Amputation

Classific. (1) **CIRCULATORY GANGRENE**(A) *Circulatory incompetency gangrene* *

Etio (a) Exhausting diseases

(b) Toxæmias

Path (a) Incompetent heart

+ (b) Arterio sclerosis

+ (c) Slow circulation

↓ (d) Malnutrition of peripheral parts

Sites (a) Distal parts of limbs

(b) Ears + tip of nose

Clinic (a) Dry

or (b) Moist if thrombosis

(c) Symmetrical

Treat (1) Conservative

(2) Cardiac stimulants

(B) *Embolic gangrene* * (See pages 143 to 153)

Etio (a) Endocarditis

(b) Arterio sclerosis

Path (1) Sudden cutting off of the blood supply

↓ (2) Ischæmia

Clinic (a) **Intense local pain :**

In the course of an artery

↓ (b) **Distal ischæmia :**

(a) Loss of pulse

(β) Loss of heat

(γ) Change of colour

↓ (c) **Gangrene :**

(a) Dry

or (β) Moist : aseptic or sep**

Treat: (1) **Embolectomy :**

Ind (a) Young age

(b) Lower limb

- (c) Large artery
- (d) Absence of capillary sclerosis
- (e) *Within 6 hours of onset*

(2) Expectant :

Ind Upto 48 hours

Treat Vasodilators : Eupavarine, etc.

(3) Amputation :

Ind Established gangrene

Site. *Above the embolus*(C) *Thrombotic gangrene*

Types (1) Arterial :

- Etio
- (a) Endarteritis
 - (b) Atheroma
 - (c) Acute arteritis
 - (d) Embolism
 - (e) Trauma
 - (f) Infective and wasting diseases

Clinic Dry gangrene

Treat As in embolic gangrene

(2) Venous :

- Etio
- (a) General debility
 - (b) Toxaemia
 - (c) Sluggish circulation
 - (d) Pressure tourniquet
 - (e) Infiltration malignancy
 - (f) Local sepsis puerperal sepsis

- Predis
- (a) Typhoid
 - (b) Plaster immobilisation
 - (c) Malignant infiltration

Clinic Moist gangrene

Treat Amputation
Above the level of lesion(D) *Ligation gangrene*

- Predis
- (a) Exhausting diseases
 - (b) Peripheral arterio sclerosis
 - (c) Aneurysm (thrombosis + pressure)

- Cause
- (1) Ligation of main artery alone
 - (2) Hunterian operation
- Proximal ligation at a distance

- Treat
- (1) Prophylactic
Tie the companion vein
 - (2) Curative
Expectant → amputation
As low down as possible

(E) *Vascular traumatic gangrene*.

Syn: Indirect traumatic gangrene

- Path: (a) Contusion \rightarrow thrombosis
 (b) Hæmatoma \rightarrow pressure
 (c) Rupture or division
 (d) Laceration

- Clinic: (1) Damaged artery alone:
 : Dry gangrene
 ↓ (2) Damaged vein alone:
 : Aseptic moist gangrene
 (3) Damaged artery + vein:
 : Septic moist gangrene

- Treat: (1) Expectant treatment:
 : For 24 hours
 ↓ (2) Amputation
 Ind: (a) No recovery within 24 hours
 (b) Gangrene already started
 (c) Injury to associated structures
 (d) Old people
 Site: (a) Above the seat of injury
 or (b) Collateral circulation level

(F) *Pressure gangrene*:

- Etiol. (a) Sudden and acute:
 . *Tourniquet, bandage, plasters*
 . Hæmatoma, dislocation
 (b) Progressive:
 : Tumour, aneurysm

- Clinic: (a) Dry
 or (b) Moist

- Treat: (a) Removal of cause
 ↓ (b) Expectancy
 ↓ (c) Amputation

(G) *Semle gangrene*:

- Predispos. (a) Hyperpiesia
 (b) Chronic toxæmia:
 (a) Infective
 (β) Metabolic
 (c) Syphilis

- Etiol: (a) Arterio-sclerosis
 (b) Calcareous degeneration
 (c) Annular calcification
 + (d) Trivial trauma or infection

- Clinic: (a) Men after 40
 (b) Intermittent claudication
 (c) Rigid tortuous arteries:
 : Little or no pulsation
 (d) Dry gangrene:
 : Slowly progressive

- Compl: (a) Exhaustion
 (b) Septic infection
- Treat (1) **Prophylaxis** :
 (a) Gentle exercise and massage
 (b) Warm baths
 (c) Protection cotton wool dressings
- (2) **Threatening gangrene** :
 (a) Arterio venous anastomosis
 (b) **Peri arterial sympathectomy**
 or (b) Peri arterial alcohol
 + minims
 + (c) **Companion vein ligature**
- (3) **Established gangrene** :
 (a) Stationary
 Expectant
 (b) Progressive
 Amputation
- (H) *Pre senile gangrene* - *Buerger*
 (See pages 152 and 862)
- Treat (1) **Amputation** :
 Ind Extensive gangrene
 With or without rest pain
- (2) **Lumbar ganglionectomy** :
 Ind Trophic changes + Rest pain
- (3) **Medical measures** :
 Ind No trophic changes or pain
- (I) *Vaso spastic gangrene*
- (A) **Raynaud's syndrome** :
 (See pages 153 and 861)
- (B) **Ergot gangrene** :
- Etio Rye bread fungus claviceps purpurea
- Path (a) Peripheral arteriolar spasm
 ↓ (b) Endarteritis
 ↓ (c) Thrombosis
 ↓ (d) Dry gangrene
- Clinic (a) Nervous disturbances
 (b) Digestive disturbances
 (c) Extremities bilateral*
 (α) Cramps + coldness
 ↓ (β) Chronic dry gangrene
- Treat, (1) Remove the cause
 (2) Coffee
 (3) *Expectant treatment*

(2) NERVOUS GANGRENE

Etio: (1) *Nerve paralysis*:

- Causes: (A) **Hemiplegia**
 (B) **Paraplegia**
 (C) **Monoplegia**

- Path: (a) Modification of nutrition:
 : Trophic changes
 (b) Altered defensive strength:
 : Against bacteria

(2) *Central nervous diseases*:

- Causes: (a) **Tabes dorsalis**
 (b) **Syringomyelia**

(3) *Peripheral neuritis*:

- Causes: (a) **Diabetes**
 (b) **Leprosy**
 (c) **Cervical rib**

(4) *Sympathetic syndrome*:
 : Raynaud's diseaseClinic: (1) **Underlying disturbances**:

- (a) **Diabetes**
 (b) **Syphilis**
 (c) **Leprosy**
 (d) **Trauma**

(2) **Nervous disturbances**:

- (a) **Sensory**: Anæsthesia, paræsthesia
 (b) **Motor**: paralysis
 (c) **Trophic**

(3) **Local**:

- (A) **Perforating ulcer**: (See page 34)
 (B) **Pressure sore**: (See page 31)
 (C) **Moist spreading gangrene**

(3) TRAUMATIC GANGRENE:

(A) *Direct traumatic gangrene*:

Def: Gangrene at the site of trauma

Etio: Run overs

- Clinic: (a) **Aseptic moist gangrene**
 or (b) **Septic moist gangrene**
 or (c) **Gas gangrene**

Treat: (1) **Conservative**:

- Ind: (a) **Young patient**
 (b) **No severe injury**

- Tech: (a) **Debridement**
 (b) **Re-establish the blood flow**
 (c) **Carrel-Dakin**

(2) **Amputation :**

- Ind (a) Old and debilitated
 (b) Severe injury .
 (a) Main artery
 + (β) Main nerves
 + (γ) Muscles
 (c) Anaerobic sepsis
 (d) General intoxication

B) *Indirect traumatic gangrene*

. (See under Circulatory Gangrene)

Def. Gangrene of the distal part due to trauma to the main artery of a limb

(4) **PHYSICAL & CHEMICAL GANGRENE :**(A) *Heat*

. Burns (See page 7)

(B) *Cold*Path (a) **Cold**

- ↓ (b) Peripheral vaso constriction
 + (c) Slow circulation
 ↓ (d) Ischæmia
 + (a) **Sudden application of warmth**
 ↓ (b) Excessive vaso dilatation
 ↓ (c) Stasis
 ↓ (d) Thrombosis
 = Gangrene

Sites. Fingers, toes, ears, nose

Clinic (a) **Pernio or chilblain**

Sites Toes and fingers

Clinic (a) **Burning and itching**
 (β) **Œdematous, dusky red skin**

- ↓ (b) Cracks and fissures
 ↓ (c) Blisters
 ↓ (d) Acute spreading ulcer
 ↓ (e) Dry slow gangrene

- Treat (1) Gradual thawing
 (2) Conservative

(C) *Escharotics .*(1) **Acids :**

Etio Carbolic acid
 . 1% sol for 24 hours

Path Coagulation of tissues

- Clinic : (a) Paræsthesia → anæsthesia
 ↓ (b) Blanching + crenation
 ↓ (c) Dry gangrene

- Treat : (a) Expectant
 ↓ (b) Amputation

(2) **Alkalies :**

Path . Liquefaction of tissues

Clinic : Moist gangrene .

(3) **Bite irritants :**

Etio : (a) Scorpion bite

(b) Serpent bite

Clinic : Progressive dry or moist gangrene

(5) **DIABETIC GANGRENE :**

: (See under Diabetes)

(6) **INFECTIVE GANGRENE :**(1) *Acute inflammatory :*

Etio : Inflammation under tension

Path : Cutting off of the vascular supply

Clinic : (a) Boils

(b) Carbuncle

(c) Acute osteomyelitis

(2) *Gas gangrene :*Def . Gangrene associated with gas production
due to infection by anærobic bacteriaEtio : (A) **Trauma :** Nature of wound

(a) Lacerated

(β) Punctured

(γ) Retained foreign body

(B) **Contamination with soil :**

: Manured or street

(C) **Host :**

(a) Interference with circulation :

(a) Occlusion of main artery

or (β) Pressure

(b) Retention of extravasated blood

(c) Low blood pressure

(d) Low vitality

Bact : Anærobic saprophytes in the intestines of
man and animals :(A) **Proteolytic + Saccharolytic :**(a) **Proteolytic + :**(1) **B. Sporogenes**(2) **B. Parasporogenes**(3) **B. Centrosporogenes**(4) **B. Bifermentans**(5) **B. Aerofetidus**(6) **B. Histolyticus**(b) **Saccharolytic + :**(1) **B. Welchii**(2) **Vibrio septique**(3) **B. Chauvæi**(4) **B. Novyi**

(B) Proteolytic only :
: **B. Tetani**

(C) Saccharolytic only :
(1) B Fallax
(2) B Multifermentans
(3) B. Tertius
(4) B Tetanomorphus
(5) B Sphenoides

(D) No lysis
: B. Cochlearius

Biochem : (1) B Welchii
↓ (2) Carbohydrate fermentation
↓ (3) Gas + acids
↓ (4) Acidic inhibition of B. Welchii
+ (5) B Sporogenes
↓ (6) Protein destruction
↓ (7) Foetid gas + ammonia bodies
= (8) Neutralisation of acids
↓ (9) Virulent B Welchii
↓ (10) Toxæmic adrenal paralysis

Path : (a) **Dissemination along**
(α) Direct muscle infiltration
(β) Loose connective tissues
(γ) Lymphatics
(δ) Blood stream
(b) **General toxæmia :**
Asthenic and toxic shock

Morb anat (1) **Gas formation**
(2) **Tissue necrosis :**
(a) Muscles
(α) Red death
↓ (β) Yellow death
↓ (γ) Black death
(b) Blood vessels
Thrombosis
(c) Hemolysis
(3) *Entire absence of inflammation*

Clinical synd : (1) **Localised :** Local wound
(2) **Group :** Muscle group
(3) **Massive :** Whole limb
(4) **Fulminating :** Extending

Clinic : (1) *Dramatically sudden onset*
(2) Local signs
(a) Change in colour
(b) Blebs and bullæ
(c) Non inflammatory œdema
(d) *Crackling gas*

- (e) Fœtid discharge
- (f) Extensive sloughs

- (3) General signs :
 - (a) Toxic shock
 - (b) Hæmolysis

Treat : (A) Preventive :

- (a) Avoid pressure
- (b) Avoid dry dressings
- (c) Avoid tight plugging
- (d) Avoid arterial injury
- (e) Avoid shock and hæmorrhage
- (f) Prophylactic anti-serum
- (g) Oxygenation of wound : H_2O_2

(B) Curative :

- (1) *Anti serum*
- (2) Excision of wound
- or (2) Multiple incisions :
 - : With H_2O_2 irrigations
- or (2) **Guillotine amputation :**
 - Ind : Fulminating
 - Site : Well above the lesion
- + (3) *Anti serum*
- + (4) Blood transfusion
- (5) Intravenous soda-bi-carb

(3) *Cancrum oris* :

Def : Infective gangrene of mouth and face

- Etio : (a) Children
- (b) Debility, exhaustion, toxæmia
 - (c) Inattention to oral hygiene

Bact : *Streptococcus*

Path . Extending diffuse gangrene

- Clinic : (1) General toxæmia or exhaustion
- (2) Local . inside the oral cavity
 - (a) Greyish patch
 - ↓ (b) Slough . black
 - ↓ (c) Gangrene
 - ↓ (d) Perforation cheek

- Compl : (1) Septic intoxication
- (2) Broncho-pneumonia
 - (3) General asthenia
 - (4) Deformity

- Treat . (1) Excision
- + (2) Cauterisation
 - By : (a) Cautery
 - (b) Carbolic or nitric acid
 - + (3) Treatment of general condition

(B) Proteolytic only :

: **B. Tetani**

(C) Saccharolytic only :

(1) **B. Fallax**

(2) **B. Multifermentans**

(3) **B. Tertius**

(4) **B. Tetanomorphus**

(5) **B. Sphenoides**

(D) No lysis :

: **B. Cochlearius**

Biochem : (1) **B. Welchii**

↓ (2) Carbohydrate fermentation

↓ (3) Gas + acids

↓ (4) Acidic inhibition of **B. Welchii**

+ (5) **B. Sporogenes**

↓ (6) Protein destruction

↓ (7) Fused gas + ammonia bodies

= (8) Neutralisation of acids

↓ (9) Virulent **B. Welchii**

↓ (10) Toxaemic adrenal paralysis

Path : (a) Dissemination along :

(α) Direct muscle infiltration

(β) Loose connective tissues

(γ) Lymphatics

(δ) Blood stream

(b) General toxæmia :

Asthenic and toxic shock

Morb anat : (1) **Gas formation**

(2) **Tissue necrosis :**

(a) Muscles :

(α) Red death

↓ (β) Yellow death

↓ (γ) Black death

(b) Blood vessels :

Thrombosis

(c) Haemolysis

(3) *Entire absence of inflammation*

Clinical synd : (1) **Localised : Local wound**

(2) **Group : Muscle group**

(3) **Massive : Whole limb**

(4) **Fulminating : Extending**

Clinic : (1) *Dramatically sudden onset*

(2) Local signs :

(a) Change in colour

(b) Blebs and bullæ

(c) Non inflammatory œdema

(d) *Crackling gas*

- (e) Fætid discharge
- (f) Extensive sloughs

- (3) General signs :
- (a) Toxic shock
 - (b) Hæmolysis

Treat : (A) Preventive :

- (a) Avoid pressure
- (b) Avoid dry dressings
- (c) Avoid tight plugging
- (d) Avoid arterial injury
- (e) Avoid shock and hæmorrhage
- (f) Prophylactic anti-serum
- (g) Oxygenation of wound : H_2O_2

(B) Curative :

- (1) *Anti serum*
- (2) Excision of wound
- or (2) Multiple incisions :
: With H_2O_2 irrigations
- or (2) **Guillotine amputation :**
Ind : Fulminating
Site : Well above the lesion
- + (3) *Anti-serum*
- + (4) Blood transfusion
- (5) Intravenous soda-bi-carb

(3) *Cancrum oris* :

Def : Infective gangrene of mouth and face

- Etiology : (a) Children
- (b) Debility, exhaustion, toxæmia
 - (c) Inattention to oral hygiene

Bact : Streptococcus

Path . Extending diffuse gangrene

- Clinic : (1) General toxæmia or exhaustion
- (2) Local : inside the oral cavity
 - (a) Greyish patch
 - ↓ (b) Slough . black
 - ↓ (c) Gangrene
 - ↓ (d) Perforation cheek

- Compl : (1) Septic intoxication
- (2) Broncho pneumonia
 - (3) General asthenia
 - (4) Deformity

- Treat . (1) Excision
- + (2) Cauterisation .
By . (a) Caustery
(b) Carbolic or nitric acid
 - + (3) Treatment of general condition

CHAPTER XI

DIPHTHERIA

Def Infection by B Diphtheria, causing extending *false membrane and toxæmia*

Etio (1) Susceptibility

(2) **Contact :**

Types (a) Direct

(a) Kissing

(β) *Droplet infection*

(b) Indirect

Infected material

With (a) Diseased person

(b) Carriers

(3) **Age: 3 to 10 years**

(4) Overcrowding and bad sanitation

Bact Klebs Löffler's B diphtheria

Path (A) **False membrane** on the muc. mem

(1) *Pharynx* Faucial diphtheria

(2) *Larynx* Laryngeal diphtheria

(3) *Nares* . Nasal diphtheria

(4) *Trachea and bronchi*

(5) Lungs

(6) Conjunctivæ

(7) Genitals

(8) Local wounds

(9) Ext aud meatus otitis media

(B) General toxæmia

Morb anat (1) Epithelial cells

(a) Inflammation

↓ (b) Necrosis

(2) False membrane

Color Dirty white brown, greyish brown

Formation (a) Fibrin

(b) Detritus

(a) Leucocytes

(β) R. B. Cs.

(γ) Epithelial cells

Characters **Adherent to deeper tissues**

Sequelæ (a) Healing under the membrane

(b) Shedding of the membrane

Clinic. (A) *Local* Incubation one to four days

(1) **Faucial.**

(a) *Sore throat*

(b) *False membrane :*

- Characters (α) *Adherent*
 (β) *Scattered*
 (γ) *Tenacious*
 (δ) *Surrounded by redness*
- Sites (α) *Tonsils*
 (β) *Soft palate → uvula*
 (γ) *Post-pharyngeal wall*

(c) *Dyspnoea and dysphagia*(2) *Laryngeal :*

- (α) *Hoarseness → aphonia*
 (b) *Dyspnoea and cyanosis*
 (c) *Crowing respiration and air hunger*
 (d) *Restlessness*

(3) *Nasal*: *Nasal discharge*(4) *Conjunctival*(5) *Otitic*(6) *Genital :*: *Vulva, vagina, prepuce*(7) *Local :*: *Wounds*(8) *Septic*(9) *Hæmorrhagic*(B) *Systemic . Toxæmia*

- (α) *Fever with malaise*
 (b) *Albuminuria*
 (c) *Circulatory depression*
 (d) *Peripheral neuritis*

Compl (1) *Acute circulatory failure :*

- (A) *Primary : toxic*
 (B) *Secondary : to*
 (a) *Respiratory*
 (b) *Cardiac*

(2) *Acute cardiac failure :*

- (A) *Primary : toxic (myocarditis)*
 (B) *Secondary to respiration*

(3) *Albuminuria*(4) *Pulmonary complications*(5) *Paralysis :**Etiology : Diphtheria toxin**Pathology : Peripheral neuritis**Sites : (a) Soft palate :*(α) *Nasal regurgitation*(β) *Nasal voice*(b) *Cardiac muscle :*: *Acute heart failure*(c) *Diaphragm*(d) *Any other muscle*

- (6) Otitis media
- Diag (1) History of exposure
(2) Sore throat
(3) False membrane
(4) Microscopical examination
(5) Schick skin reaction

- Diff diag (a) Vincent's angina
(b) Acute tonsillitis
(c) Peritonsillar abscess
(d) Retropharyngeal abscess
(e) Syphilis
(f) Laryngitis
(g) Scarlet fever

Prognosis *Depends on early diagnosis & early treatment*

- Bad in (a) Early age
(b) Late treatment
(c) Extension of membrane :
(a) One tonsil mild
(β) Two tonsils serious
(γ) Tonsil + fauces grave
(δ) Larynx ? hopeless
(d) General toxæmia
(e) Heart condition

- Treat (1) *Prophylactic swab in every tonsillitis*
(a) 500 units of antiserum
(b) Antiseptic gargles
(c) Hand washes
(d) Isolation :
(a) For one month after apparent cure
(β) Upto negative swabs
(e) Disinfection of contact things
- (2) *Hygienic*
(a) Free ventilation
(b) Sponge baths
- (3) *Dietetic :*
Liquid or semisolid food
- (4) *Constitutional :*
(a) Rest in recumbency
(b) Treat
(a) Heart and circulation
(β) Kidneys
(γ) Bowels
- (5) *Anti serum.*
(A) Antidiphtheritic :
Routes (a) Intramuscular
(b) Intravenous

Dose: (a) Within few hours :

: 3,000 units

(b) 6-12 hours :

: 5,000 units

(c) Localisation to tonsils

: 5,000 units

(d) Soft palate, uvula :

: 10,000 units

(e) Nasal fossa and larynx :

20,000-30,000 units

(f) Septic and hæmorrhagic cases :

: 40,000-50,000 units

Comp! (a) Serum sickness

(b) Anaphylaxis

(B) Antistreptococcal :

Ind. High temperature

(6) *Local :*

(a) Oral treatment :

(α) Alkaline washes

(β) Alkaline irrigations

(γ) Alkaline gargles

(b) 1% argyrol gargles & applications

(7) *Operative :*

(A) Intubation of larynx :

Ind: (a) Rapid pulse

(b) Laboured breathing

(c) Dyspnoea & cyanosis

(d) Restlessness

Position: (1) O'Dwyer's upright position

(2) Dorsal method

Duration (a) One week

(b) Free breathing for 2 days

(B) Tracheotomy :

Ind. (a) Difficult intubation

(b) Extension into trachea

+ (c) Lower trachea free

CHAPTER XII

SYPHILIS

- Course • (A) Incubation : 9 → 90 days
 ↓ (B) Primary Chancre
 ↓ (C) Local → general lymphadenopathy
 ↓ (D) Wassermann : After 30 days
 ↓ (E) Secondary stage : After 30 to 45 days
 (a) Rash :
 (1) Erythematous
 (2) Papular
 (3) Papulo squamous
 (4) Squamous
 (5) Papulo pustular
 (6) Pustular
 (7) Ecthymatous
 (8) Mucous patches
 (b) Secondary anæmia
 (c) Malaise + Pyrexia
 ↓ (F) Period of quiescence : 1 → 4 years
 ↓ (G) Tertiary stage :
 (a) Gummata
 (b) Neuro syphilis
 (c) Circulatory syphilis
 (d) Liver, kidneys

Bact *Treponema pallidum*

- Path (a) Infection by treponema
 (b) Spread along lymph channels .
 (α) Subcutaneous
 (β) Perivascular
 (γ) Perineural

- Morb anat (a) Proliferation of
 (1) Connective tissue cells
 (2) Endothelial cells
 (3) Lymphocytosis
 (4) Plasma cells
 (5) Fibroblasts
 (6) Giant cells
 (b) Endarteritis obliterans

- Sequelæ • (A) Primary stage
 (a) Resolution
 or (b) Fibrosis
 (B) Tertiary stage
 (a) Fibrosis
 or (b) Ulceration

Diagnosis (1) **Microscopical exam** • Earlier secretions
Dark ground method

(2) " " "

(3)

(4) (

(a) Lymphocytosis

(b) Albumin and globulin +

(c) Wassermann +

(d) Lange's gold test

Clinic (1) **Primary lesion** *Chancere*

Characters (a) Treponema in secretion

(b) Rose pink band

(c) Stiff and rubbery

(d) Painless enlargement of glands

(e) Induration

(f) Long incubation period

Sites (A) **Genital chancre** :

Clinic (a) *Indurated papule*

↓ (b) Painless regional adenopathy

Sites (a) Male genitals

(1) Preputial rim

(2) Preputial mucous mem

(3) Glans penis

(4) Ext. urinary meatus

(5) Skin of the penis

(6) Skin of the scrotum

(b) Female genitals

(1) Labia

(2) Cervical orifice

Compl (a) Syphilitic indurative cedema

(a) Penile skin

(β) Preputial margin

(γ) Labial skin

(b) Phimosis

(c) Septic balanitis

(d) Phagedæna

(e) Inguinal adenitis

Diag Microscopical exam of scrapings

from (a) Margins of the chancre

(b) Enlarged lymph gland

Diff diag (a) Balanitis

(b) Herpes genitalis

(c) Scabies penis

(d) Secondary lesions

(e) *Soft chancre*

(a) Incubation less

(β) *Painful*

- (r) *Multiple*
- (f) *Scar formation*
- (u) *Inguinal adenitis*

(B) Extragenital chancres

- Clinic (a) *Indolent indurated sore*
 (b) *Indolent massive regional adenitis*
- Sites (a) *Anus and rectum*
 (a) *Indurated fissure or ulcer*
 (β) *Abnormal discharge*
- (b) *Fingers*
Superficial erosion or papule
Whitlow
- (c) *Lips*
Indurated erosion or ulceration
- (d) *Tongue*
Raised sore
- (e) *Fossils*
Enlarged and indurated
- (f) *Eyelids*
Pink papule at inner canthus
- (g) *Conjunctiva*
Papule
- (h) *Lacrimal tube*
- (i) *Breast*
Indurated indolent fissure

(C) Adenitis

Site *Regional → general*

Clinic *Smooth discrete oval, indurated*

(2) Secondary lesions

(1) **Erythema of the soft palate**

(2) **Skin eruptions**

- Types (a) **Roseolar or macular**
 (b) **Papular**
 (α) *Lenticular*
 (β) *Follicular*
- (c) **Papulo squamous**
- (d) **Squamous**
- (e) **Papulo pustular**
- (f) **Pustular**
- (g) **Follicular**
 (α) *Small*
 (β) *Large*
- (h) **Ecthymatous**
- (i) **Condylomas**
- Sites (a) **Palms and soles**
 (b) **Forehead Corona veneris**
 (c) **Face**
 (d) **Penis**

- (e) Scrotum
- (f) Moist surfaces
- Diag. (a) *Pleomorphism*
- (b) *Absence of irritation*
- (c) Collarette of loose epith.
- (d) *Copper colour*
- (e) Characteristic grouping
- (f) Circular or oval shape
- (g) *Treponema in secretions*
- (3) **Mucous membranes : Mucous patches**
- Sites (a) Faucial pillars
- (b) Lips
- (c) Tonsils
- (d) Tongue
- (e) Angle of the mouth
- Clinic (a) Ulcer
- (b) Fissure
- (c) Papule
- (4) **Laryngitis :**
Chronic laryngitis with little discomfort
- (5) **Hair : Alopecia**
- (6) **Nails : Onychia and paronychia**
- (7) **Bones :**
(a) Osteocopic pains
- (b) Periosteal nodes
- (8) **Synovial membranes :**
- Clinic Quiet effusion
- Sites Knees and elbows
- (9) **Eyes :**
(a) Iritis and irido cyclitis
- (b) Choroiditis and retinitis
- (c) Interstitial keratitis
- (d) Neuro-keratitis
- (10) **Ears :**
(a) Deafness
- (b) Otitis media
- (11) **Testicle**
- (12) **Veins : Thrombo phlebitis**
- (13) **Visceral lesions :**
(a) Nephritis
- (b) Acute yellow atrophy of liver
- (c) Gastro intestinal syphilis
- (d) Lung infiltration
- (14) **Nervous lesions :**
(a) Meningitis
- (b) Meningo myelitis
- (c) Myelitis
- (d) Meningo-encephalitis
- (15) **Anaen**

(3) *Tertiary lesions :***: Gumma :**

Clinic : (a) History of trauma

(b) *Induration*(c) *Circular shape*

(d) Abscess formation

(e) *Gummy discharge*(f) *Punched out ulcer*

Sequelæ (a) Resolution

(b) Fibrosis

(c) Osteosis

Sites : (1) **Skin :** Nodular cutaneous syphilide

· Scaly deep red nodules

↓ Punched-out shallow ulcers

↓ *Soft tissue paper scars*(2) **Subcutaneous :**

(a) Rubber-like nodules

↓ (b) *Punched out ulcers*(3) **Muscles :**

(a) Gummatous infiltration

(b) Local gumma

(4) **Bones :**

(a) Local gummatous osteo periostitis :

Sites . Clavicle, sternum, ribs

· Tibia, cranium

Clinic : (a) Smooth ivory-like boss

(β) Funnel like ulcer

(b) Diffuse osteo-periostitis :

Clinic . Chronic, tender, thickening

(A) Facial and nasal bones :

(a) *Ozæna*(b) *Saddle nose*(c) *Perforated palate*

(B) Orbit

(C) *Dactylitis :*

Def. : Gummatous osteitis of phalanx

Clinic : (a) Painless thickening

or (b) Painless absorption

or (c) Discharging sinus

Diff. diag. (a) T. B dactylitis

(b) Enchondromata

(5) **Synovial membranes :**

(a) Diffuse gummatous infiltration

(b) Gummatous nodules

(6) **Testicle :**

(a) Interstitial gummatous orchitis :

: Large, smooth, elastic, heavy

(b) Gumma :

- Clinic (a) *Painlessly enlarged body*
 ↓ (β) *Gummatous anterior ulcer*
 or (γ) *Atrophy testis*
 or (δ) *Hernia testis*
- Diff diag (a) *T. B testis*
 (β) *Malignant testis*
- (7) **Penis :** *Gumma of the body*
- (8) **Mucous membranes :**
 (a) *Lip*
 (α) *Infiltration*
 (β) *Nodule*
 (γ) *Ulcer*
 (b) *Cheek*
 Leucoplakia of angle of mouth
 (c) *Tongue Local gumma*
 (α) *Superficial glossitis*
 (β) *Leucoplakia*
 (γ) *Gumma*
 (d) *Palate Perforation*
 (α) *Gumma → perforation*
 (β) *Nodular infiltrations*
 (γ) *Ulcers*
 (δ) *Dense white scars*
 (e) *Tonsils*
 Painful elastic swelling
 (f) *Posterior pharyngeal wall*
- (9) **Ears**
- (10) **Larynx :**
 (a) *Tertiary infiltration*
 ↓ (b) *Ulceration*
 ↓ (c) *Deformity*
- (11) **Arteries :** *Aneurysm*
- (12) **Gastro-intestinal canal :**
 (a) *Signs of cancer stomach*
 (b) *Acute abdomen tabetic crises*
- (13) **Liver :**
 (a) *Perihepatitis*
 (b) *Cirrhosis*
 (c) *Local gumma*
- (14) **Rectum :**
 (a) *Gumma*
 (α) *Submucous swelling*
 ↓ (β) *Recto vaginal fistula*
 (b) *Gummatous infiltration.*
 (α) *Proctitis*

- (15) **Breast :**
 (a) Local gumma → ulcer
 (b) Diffuse gummatous infiltration
- (16) **Brain :**
 (a) Local gumma
 (b) Diffuse gummatous meningitis
- (17) **Spinal Cord :**
 (a) Gummatous meningitis
 (b) Gummatous periostitis

Treatment .**Of Syphilis****(A) Prophylactic**

- (1) Steep in 1—2000 Hg biniodide
 ↓ Application of R Calomel 33
 Lanoline 67
 Vaseline 10
- (2) Three weekly injections
 (a) 606 0.3 gms
 (b) 914 0.45 gms
- (3) Ingestion
 Stovarsol tablets of 0.25 gm
 Four before breakfast for five days
 In 2 or 3 successive weeks

(B) Curative**(1) Dressings of lesions****(a) Chancre****(α) Applications**

- (1) Glycerine boracic lotion
 (2) Lotio rubra
 (3) Lotio hydrargyri nigra
 (4) Mercury biniodide 1-1000
 (5) Ung. diimido-azo-toluol
 (6) Ung. hydrargyri

(β) Baths

- (1) Hot pot permang · 1-6000
 (2) Hot boric acid
 (3) Choramine-T

(γ) Cleansing of sloughless wound

R	Zinc sulph	grs	x
	Alum purif	grs	xx
	Glycerine	3	ii
	Aqua ad	pint	i

(b) Condylomata ·**(α) First 24 hours**

Eusol, Hg biniodide

(β) Afterwards

- (1) Glycerine ichthyol · 5%
 (2) Glycerine thymol Co
 (3) Calamine lotion

(c) **Gummatous ulcers**

(α) Sloughy ulcer

- (1) Fomentations of
 - () Chlorinated soda
 - () Eusol
- (2) Vaseline to surroundings

(β) Clean ulcer

- (1) Lotion rubra or nigra
- (2) Unna's bandage
- (3) Scarlet red

(2) *General antisyphilis therapy*(A) *Arsenic*Preparations (1) **Salvarsan 606**

Characters Yellow acid powder

Tech Dissolve in NaOH sol

Dose 0.2 → 0.6 gms

Route Intravenous

(2) **Sodium salvarsan**

Characters Yellow neutral powder

Tech Dissolve in water

(3) **Neo salvarsan 914**

Characters Yellow powder

Tech Dissolve in 2-5 ccs of water

Dose 0.45 → 0.9 gms

Route

- (a) Intravenous
- (b) Intramuscular
- (c) Subcutaneous

(4) **Sulfarsenol**

Characters Yellow powder

Tech Dissolve in water

Dose 0.6 gm per c c of water

Routes

- (a) Subcutaneous
- (b) Intramuscular
- (c) Intravenous

(5) **Sulfoxylate 1495**(6) **Silver salvarsan**

Characters Emery coloured powder

Tech Dissolve in 8 ccs of water

Dose 0.15-0.3 gm

Route Intravenous

Ind Neurosyphilis

(7) **Stabilarsan**

Character 606 in glucose 50%

Tech Slow injection

Routes Intramuscular or veno

Contraind for arsenobenzene preparation:

- (1) Haemophilia
- (2) Albuminuria

- (3) Enlarged liver
- (4) Jaundice
- (5) Advanced visceral disease

Precautions: (1) Do not starve beforehand:
: Two hours fasting

- (2) Oral: R Glucose 3 xiv
Soda bi carb grs. xv
Ol. limonis m i
Aqua ad 3 iii

- (3) Examine urine and liver & skin
- (4) Examine ampoule
- (5) Syringes & lotions must be cold
- (6) Remove spirit or alcohol:
: By distilled water

Compl: (A) *During or immediate after:*

(1) Nitroid crisis:

- (a) Spt ammon. aromat:
: xxxm.; 5 min. before
- (b) Subcut. adrenalin 1 c.c.
- (c) Alternating method:
(a) Inject 2 c.c. sol.
↓ (β) Aspirate 1 c.c.
blood

(2) Medical shock: Syncope

Path: Capillary paralysis

Clinic: Alarming collapse

Treat: Intravenous saline

(3) Urticaria

(4) Pain in gums & teeth

(B) *Few hours after:*

- (1) Rigors with pyrexia
- (2) Vomiting with diarrhoea
- (3) Herpes

(C) *Within five days:*

(1) Encephalitis:

Treat: (a) Rest in bed

- (b) Spinal puncture:
: Aspirate c.s.f.
50 c.cs.

- (c) Venesection:
: 60-100 c.cs.

(d) Purgings

(e) Soda bi-carb.

- (f) Adrenalin injection:
: v.m. every 4 hours

- (g) Sod thiosulphate
- (h) Oxygen inhalations

(2) Bone marrow syndrome

- Clinic (a) Purpura hæmorrh
(b) Thrombocytopenia
(c) Agranulocytosis
(d) Aplastic anæmia

Treat Blood transfusion

(D) *Within one month*

(1) **Albuminuria**

(2) **Stomatitis**

(3) **Lassitude**

(4) **Dyspepsia**

(5) Chronic headache

(6) Dermatitis

Treat (a) Starch bath

(b) Talc dust

(c) Olive oil

(d) R Zinc oxide $\frac{3}{4}$ i

Starch $\frac{3}{4}$ i

Petroleum $\frac{3}{4}$ ii

(e) Sod thiosulphate

Intraven 20 c.cs

(7) **Jaundice :**

Treat (a) Glucose

(b) Soda bi carb

Treatment Of complications

(1) **Sodium thiosulphate :**

Intravenous

0.6-0.9 gm

Every other day

(2) Hypertonic intraven. glucose

25 c cs of 25%

(3) Intramuscular Intramine

(4) Intravenous Redoxon (Roche)

5 c cs

(B) **Mercury**

Advant • Slow but continuous action

Methods (1) Oral

(2) Inunction

(3) Intramuscular

(4) Intravenous

- Preparations • (a) Hydrargyrum cum creta : oral
 (b) Ung hydrargyri :unction
 (c) Mercury perchloride intraven
 (d) Mercury biniodide intramusc
 (e) Calomel intramuscular

- Compl (1) **Stomatitis**
 (2) Nephritis
 (3) Colitis
 (4) Dermatitis
 (5) **Malaise**

(C) *Bismuth*

- Routes (a) Deep subcutaneous
 (b) Intramuscular

- Prepar (1) Solubles
 (b) Insolubles
 • Oxychloride, salicylate, etc.
 (c) Oil solubles
 (α) Bivatol 2 c.c.s
 (β) Cardyl

- Dose 0.2 → 0.3 gm
 Once or twice a week
 Upto a total of 2-4 gms.

- Compl (a) Blue line gums
 (b) Stomatitis
 (c) Albuminuria
 (d) Dermatitis
 (e) Colitis
 (f) Muscular rheumatism

- Treat (a) Sodium thiosulphate
 (b) Intramine

(D) *Iodine* Pot iodide :

- Action (a) Resolution of fibrous tissue
 ↓ (b) Access to spirochaeta

- Dose R Pot iodide grs 1-1x
 Pot bicarb grs xx
 Tr nucis vomica m iii
 Aqua chloroform ad ounce i
 T D S

CONGENITAL SYPHILIS

Clinic (1) History.

- (a) Miscarriages
 ↓ (b) Premature dead foetus
 ↓ (c) Syphilitic infants
 (α) Clinical manifestations
 ↓ (β) Late solitary lesions
 ↓ (γ) Only serum positive
 ↓ (d) Healthy children

(2) **Skin lesions :**(a) **Pemphigus :**

- : Bullæ → pustules
- : On palms and soles

(b) **Maculo papular :**

- : *Napkin area*
- : *Nose and mouth*
- : *Palms and soles*

(c) **Gummata → gummatous ulcers**(d) **Muco cutaneous syphilides :**

- : Face and outer side of thighs

(3) **Onychia**(4) **Hair lesions**

- : Loss of eyebrows, syphilitic mop

(5) **Mouth lesions :**(a) **Mucous patches**(b) **Perforation palate**(c) **Faucial ulceration & scars**(6) **Teeth lesions :**(a) **Hutchinson's teeth :**

- : Peg-shaped upper central incisors

(b) **Hypoplastic teeth**(c) **Moon's teeth .**

- : Dome-shaped first molars

(7) **Nasal lesions :**(a) **Snuffles**(b) **Saddle nose**(c) **Perforation palate**(8) **Laryngitis :**

- Hoarse cry

(9) **Lung lesions :**(a) **White pneumonia of Virchow**(b) **Localized gummata**(10) **Heart and vascular lesions**(11) **Umbilicus Gumma**(12) **Intestines :**

- : Multiple gummatous ulcers

(13) **Liver :**(a) **Diffuse interstitial hepatitis**(b) **Local gummata**(14) **Spleen :**

- : *Splenomegaly before the age of 3*

(15) **Nephritis**(16) **Testicles :**(a) **Enlargement before the age of**(b) **Shrunken testis :**

- : Without any trauma or disease

(17) **Bones**(a) *Epiphysitis*

- Sites (a) Lower ends of humerus & radius
 (b) Upper end of tibia
 (c) Costo chondral junctions

Clinic Parrot's pseudo paralysis

(b) *Dactylitis*(c) *Periostitis*

Time Between the age of 8 and 14

Clinic (a) Localized bosses

(β) Thickened ends

(γ) Diffuse fusiform enlargement
 Sabre scabbard tibia

(d) *Flat bones*

(a) Perforation palate

(β) Skull

(1) Necrosis

(2) Hot cross bun

(3) Craniotabes

(γ) Sternal swelling

(18) **Joints**

(a) Suppurative epiphysitis

(b) Insidious chronic synovitis

Clinic *Painless bilateral effusion*

Syn Clutton's joint

Age 5 to 18 years

(c) Osteoarthritis

(19) **Nervous system :**

(a) Gumma of the brain

(b) Juvenile tabes

(c) General paralysis

(20) **Eye lesions :**

(a) *Interstitial keratitis*

(b) Iritis, irido-cyclitis

(c) Choroiditis

(d) Cataract

(e) Optic atrophy

(21) **Ear lesions :**

(a) Congenital nerve deafness

(b) Otitis media

(c) Otorrhœa

(d) Internal ear deafness

(22) **Blood**

Positive Wassermann or Kahn

Treat (1) **Treatment of mother :**

During pregnancy

(2) **Treatment of infant :**

- (A) *Mercury:*
 - (a) *Oral: Calomel or grey powder*
 - (b) *Injections; mercurial cream*
 - (c) *Inunctions: mercurial ointments*
 - (B) *Bismuth.*
 - 3-4 mgm. per kgrm body weight*
 - (C) *Arsenic*
 - . 005-0.15 gm. of 914.*
-

(7) **General treatment :**(A) **Pyrotherapy :**

Ind : (a) Good heart

(b) Good tolerance to temp

Tech : Raise temp. to 106.5.

(a) Intravenous T. A. B.

(b) Malarial parasites

(B) **Sulphanilamide :** (esp M. & B. 693)

(a) 4.8 g daily for 2 days

↓ (b) 3.6 g. daily for 3 days

↓ (c) 2.4 g. daily for 4-8 days

(C) **Antitoxin :**

(a) 1 c.c. daily for 5 days

(b) 1 c.c. every other day : 10 inj.

Compl. (1) **Balanitis :** Balano posthitis

Etio : Phimosis

Compl : (a) Lymphangitis

(b) Cellulitis

(c) Phagedæna

Treat *Dorsal slit*

Aftertreat (a) Irrigations and baths :

: H₂O₂; mercury bismiodide, eusol

(b) Packs of acriflavine gauze

(c) Dusting powder

: Zinc oxide + boric acid

(2) **Periurethral abscess :**

Etio : Littritis

Clinic (a) Indurated mass

↓ (b) Fluctuating tumour

Compl. Urinary fistula

Treat *Aspiration* → incision(3) **Venereal papillomata :**

Site. (1) External genitals

(2) Perineum and perianal region

Treat. (1) Trichlor acetic acid 100%

(2) Mill's wart paint :

: R Liq arsenicalis

1 part

Vin specac.

1 part

Spt. vin. rect.

2 parts

(3) X Rays or *diathermy*(4) *Dry dressings*(4) **Cowperitis :**

Path : (a) Acute

(b) Chronic

Clinic : Prostatitis syndrome

Diag : (a) Digital (rectal) examination

(b) Urethroscopy

- Treat : (a) Acute : rest
(b) Chronic : urethral massage

(5) **Spermato-cystitis :**

- Clinic : (a) Erections and hæmospermia
(b) Tender mass : rectal exam.

- Path. (a) Acute
(b) Chronic

- Treat : (a) Acute : rest
(b) Chronic : massage

(6) **Epididymitis :**

- Predisp : (1) Alcohol
(2) Exercise
(3) Sexual intercourse
(4) *Instrumentation : in acute urethritis*

Time. During or after second week

- Clinic : (a) Urethral discharge. less
(b) Local acute inflammation
(a) Painful, tender epididymis
(b) Hydrocele

- Diff. diag : (a) *B coli* urethritis
(b) Traumatic urethritis
(c) Septic instrumentation
(d) Acute T. B. testis

- Treat : (a) Sharp saline purge
(b) *Intravenous calcium gluconate 10 c cs.*
(c) *Sulphonamides*
(d) Local
(a) Stoppage of instrumentation
(b) Rest with elevation
(c) Applications
(1) Glycerine—belladonna
(2) Lead and opium lotion
(3) Fomentations and hot baths

Compl : Sterility : (if bilateral affection)

(7) **Acute prostatitis and prostatic abscess :**

- Clinic : (a) Perineal pain
(b) Trigonal syndrome.
: Urinary tenesmus
(c) Enlarged tender prostate.
: Rectal examination
(d) Constitutional signs

- Treat : (A) Acute stage :
(a) No instrumentation
(b) *Complete rest*
(c) *Hot hip baths*
(d) Belladonna suppositories
(e) Rectal hot irrigations

(B) Chronic stage:

- (a) Prostatic-urethral massage
↓ (b) Urethral irrigations

(8) Ascending infection :

- (a) Cystitis
↓ (b) Ureteritis
↓ (c) Pyelitis
↓ (d) Pyelonephritis

(9) Gonorrhœa rectalis

Etio Women

- Path (a) Proctitis
(b) Venereal warts
(c) Ulcer

Clinic. Rectal tenesmus with discharge

Treat: Rectal irrigations:

- (a) Pot permanganas: 1 in 500
(b) Silver nitrate: 1 in 500

(10) Metastatic gonorrhœa:

Syn. Gonorrhœal rheumatism

Etio. Any stage of urethritis

Path. Gonorrhœal septicæmia

Clinic: (A) *Gonococcal arthritis*: (see page 364)

- (a) Arthralgia
(b) Acute arthritis
(c) Hydrarthrosis
(d) Polyarthritides deformans

(B) *Gonorrhœal fascitis*:

- (a) Lumbago
(b) Talalgia

Treat. (1) Focal. Urethral irrigations

- (2) Local (a) Counter-irritants
(b) Massage
(c) Movements

(3) General: Immuno-therapy

- (a) Auto vaccines
(b) Stock vaccines
(c) Protein shock therapy

(11) Eye complications:

Clinic: (A) *Gonorrhœal conjunctivitis*:

Syn: Ophthalmia neonatorum

Etio: Infection during delivery

- Clinic: (a) Swollen lids with chemosis
(b) Profuse purulent discharge

Compl: Corneal ulceration

(B) *Iritis*

Treat: (a) Silver nitrate 2%: prophylactic

- (b) Boric or saline wash

- ↓ (c) Silver nitrate 1%
(d) Vaccines

- (12) **Skin complications :**
(a) Vesicular and pustular eruptions
(b) Purpura
(c) Hyperkeratosis
- (13) **Cardiac complications :**
: Endo, peri or myo carditis
- (14) **Other complications :**
(A) *Tenosynovitis*
(B) *Myositis*
(C) *Fibrositis*
(D) *Pleurisy*
(E) *Meningitis*
(F) *Peritonitis*
(G) *Periostitis*
(H) *Myelitis*
(I) *Subcutaneous abscess*
- (15) **Female complications :**
(1) *Bartholinitis*
(2) *Cervicitis*
(3) *Metritis*
(4) *Salpingo oophoritis*
(5) *Rectal gonorrhoea*
- Cure tests · (1) Absence of urethral discharge
(2) Absence of pus in urine
(3) Anterior urethroscopy :
(a) No infiltration
(b) No stricture
(4) Absence of gonococci in urethral smear

Examinations ·

- (1) Ordinary
(2) After prostatic-urethral massage
(3) After provocative dose :
Polyvalent 200 millions

CHAPTER XIV

1 SOFT CHANCRE

Syn (A) Chancroid
(B) Ulcus molle

Def Highly contagious ulcer on the genitals due to infection by **Ducrey's bacillus**

Etio Incubation 5 days

Clinic Multiple, painful, non-indurated ulcers with undermined edges and leaving scars

Compl (1) **Bubo**
(2) Phagedæna
(3) Phimosis and paraphimosis

Diff diag (1) **Hard chancre**
(2) Herpes genitalis
(3) Granuloma inguinale
(4) Scabies
(5) *Penile gumma*

Treat (A) **Sores :**
(1) Hypertonic saline bath
(2) Alternate dressings of .
(a) Eusol
(b) Pure glycerine
(c) Formalin 1 in 300
In glucose 50%
(d) Iodoform
(3) Cauterisation
(4) Ultra violet rays
(B) **Bubo :**
(1) Aspiration
↓ (2) Iodoform emulsion injection

CHAPTER XV

GRANULOMA PUDENDA

Def: Infective chronic vascular granuloma with dense fibrosis, of the external genitalia, conveyed by sexual contact and auto inoculation

Etio: (1) *B mucosus capsulatus granulomatis* :
Capsulated intracellular diplococcus

(2) Age . 15 to 35

(3) Sex : Females

Path : Nodules of round cells :

: Embedded in delicate fibrous reticulum

: Covered by epithelium

: Great vascularity

: Fibrosis

Sites: (a) External genitalia

(b) Inguinal region

(c) Perineal region

(d) Peri-anal region

Clinic . (1) Incubation . 2 to 8 days

(2) **Nodule :**

: Small, local

: Covered with delicate pink epithelium

↓ (3) **Bleeding excoriation**

↓ (4) Eccentric peripheral extension

↓ (5) Dense, contracting, uneven scar

Diag . Narrow, serpiginous bordered, nodular, raised, red-glazed, delicately pinkish, ulcerated or cracked **new growth**, with large area of white, irregularly, pigmented, dense scar and profuse, offensive, watery **discharge**

Compl : (a) Pseudo elephantiasis

(b) Stricture urethra

(c) Recto vaginal fistula

Diff. diag : (1) **Malignancy**

(2) Syphilis

(3) Lupus vulgaris

Treat . (1) **General :**

: **Intravenous tartar emetic :**

: $\frac{1}{4}$ — $2\frac{1}{2}$ gr. every other day

(2) **Local :**

(a) **Applications :**

(a) Ung tartar emetic in paraffin : 1%

(β) Ung boric + antimony oxide + zinc oxide + calomel

- (b) Caustics
- (c) Cautery
- (d) Scraping
- (e) Excision
- (f) X Ray exposures

TROPICAL ULCER

Def Specific ulcerating granuloma of the skin caused by *Leishmania tropica*

Etio Sand flies

Path Infiltration of derma
By small round granulation cells

- Clinic (1) Initial papule
↓ (2) Scaling and crusting
↓ (3) Slowly extending indolent ulcer
(a) Raised thickened edges
(b) Serous or milky discharge
(c) *Leishmania* in scrapings
↓ (4) Depressed white scar

- Clinical types (a) Papular
(b) Verrucose
(c) Lupus like
(d) Generalized

- Treat (1) Intravenous tartar emetic
½ gr in 10 c cs of sterile water
(2) Emetine hydrochlor 0.15-1.5 gr
Local injection
(3) Tartar emetic ointment local
(4) Phosphorus oil local

IMPORTANT POINTS

- (1) Amount of antitoxin in an immunised animal is out of all proportion to the toxin injected
- (2) Every injury gives an added advantage to the bacteria lodged in the wound *the integrity of the wall of leucocytes around the bacteria is a factor of great importance in checking the advance of micro organisms in the tissues*
- (3) After every injury there is a phase of cellular shock with paralysis of all cellular activity. The defensive mechanism of the cells and their capacity for resistance are held in abeyance
- (4) Necrotic tissues once infected are a source of persistent infection they form a suitable and even essential pabulum for certain bacteria
- (5) Dead spaces furnish conditions favourable for infection and when infection is once established, tend to lead to persistent infection

- (6) Excessive tissue tension promotes infection and leads to its persistence and spread
- (7) Foreign bodies are not only extremely important in fixing or lodging bacteria in the tissues but have a real significance in determining whether or not infection takes place and a striking influence on the persistence of infection
- (8) *General defence of the body to the infection is through reticulo endothelial system which acts by*
 - (a) Phagocytic action
 - (b) Secretion of anti substances
- (9) Different species of micro organisms incite a different response in the invaded body and show a marked predilection for different tissues
- (10) *Oedema of the overlying skin may be the first sign of deep seated suppuration*
- (11) In trifling injuries with introduction of virulent germs, localisation sometimes takes place first in the regional lymph glands
- (12) *At any age of an abscess its margin should be treated with very great care and tenderness*
- (13) Normally the surface of the body is in contact with countless organisms
 - (a) The skin
 - (b) Gastro intestinal tract
 - (c) Upper respiratory tract
 - (d) Urinary tract near the orifices
 - (e) Genital tract upto cervix
 - (f) Ducts opening on internal or external surfaces
- (14) *Obstruction to the outflow of urine with stagnation is the most important etiologic factor in urinary sepsis*
- (15) Nitrogen in combination with hydrogen as amino nitrogen is the very corner stone of life
- (16) The simple living together of bacteria is called symbiosis connoting a mutually beneficial effect
- (17) *No septicæmia is maintained unless there is some focus constantly or intermittently pouring bacteria into blood*
- (18) Intact skin and mucous membrane relatively seldom permit the passage of micro organisms
- (19) In the great majority of cases and for the great majority of organisms there must be a slight break in the primary defensive wall or a physical change in its surface before they can pass this barrier
- (20) Most diffusible substances will lower surface tension on the side on which they are acting bacterial products

diffuse and lower the surface tension of the place to which leucocytes are attracted

- (21) *A cold abscess should never be aspirated directly over the swelling, but always at some distance away, through healthy tissues, and the track of the needle should be valvular*
- (22) *Leucocytosis is a measure of the reaction of the patient to the infection. If the relative number of polymorphs is increased to 85%, pyogenic infection is always present, regardless of the total count*
- (23) *Treatment of potential sepsis is excision or debridement*
- (24) *Treatment of established infection*
 - (a) *Aiding the local defence reaction*
 - + (b) *Supply of antibodies in circulation*
 - ↓ (c) *Incision*
 - + (d) *Extrusion of foreign bodies and necrotic tissues*
 - ↓ (e) *Drainage*
- (25) *When an acute, infective inflammation about a wound has lasted 3 or 4 days, pus has generally formed in the tissues, when acute local symptoms have been present for four or five days in a deeper focus, pus is generally present*
- (26) *Do not use local anaesthesia in inflamed tissues*
- (27) *In purulent collections in deeper tissues in circumscribed purulent collections with necrotic tissues in the peritoneum, in purulent collections in the joints and pleurae, introduce a drain upto the focus, to establish a track to the surface*
- (28) *General defence reaction as shown by toxic pyrexia is an accurate index of the drainage.*
- (29) *Too prolonged drainage tube is a dangerous thing*
- (30) *In any infection excision or wide removal of any focus after the stage of general dissemination in a body in which considerable immunity is established, is satisfactory. Excision of initial lesions and excision done during the early stages of dissemination are not satisfactory*
- (31) *Hypodermic syringe charged with adrenalin solution should be invariably in readiness whenever an antiserum is being administered*
- (32) *Give a second dose of serum within a week of the first*
- (33) *Common characters of anaerobic bacteria*
 - Habitat (a) *Faeces of herbivora*
 - ↓ (b) *Richly manured soil*
 - Morph (a) *Rod shape with round ends*
 - (b) *Irregular forms*
 - (c) *Spores.*

- (α) Oval or round
- (β) Terminal or subterminal

- (d) Motile
- Except B. Welchii

- (e) Gram positive

- (34) *Spores of all anaerobes are very resistant to heat, to drying, and to disinfectants*
- (35) Weighing machine and pyrexia are most important indications as to the correctness of dose or interval in tuberculin injections
- (36) With the exception of erysipelas stock vaccines are useless in streptococcic infections autogenous vaccines must be used
- (37) Stock vaccines of pyogenic staphylo streptococci have a distinct sphere of usefulness in prophylactic treatment of burns, scalds, and compound fractures
- (38) Prophylactic injections of autogenous B. coli vaccines are of value in colonic surgery
- (39) *Medical officers are warned against a hasty declaration of venereal disease to the patient before the clinical evidence has been confirmed by positive pathological results*
- (40) *In the examination of suspected venereal disease, always wear rubber gloves to avoid accidental infection*
- (41) In primary syphilis, 75% of cases give a positive serum result during the second week after the appearance of the chancre. In secondary syphilis 100% are positive. In tertiary stage, 80-97% and in tabes 70-90% are positive
- (42) *Drugs in general use against syphilis are*
 - (a) Arsenic
 - (b) Mercury
 - (c) Bismuth
 - (α) Lower toxicity
 - (β) Easier administration
- (43) Proper care of the primary wound is by far the most important single step in the prophylaxis of tetanus. The prophylactic dosage of the antitoxin as a routine measure is another
- (44) Any unusual septic papule or sore in a patient working among skins or hides? Anthrax
- (45) *Chronic swellings about the groin, cord, testis and scrotum in patients from the tropics should always be regarded as possibly filarial*
- (46) Anaesthesia is rarely absent in tetanus

- (77) Do not immobilise a gonococcal joint in Plaster of Paris
the right treatment is :
- (a) Massage
 - + (b) Movements
 - + (c) Radiant heat
 - + (d) Diathermy
 - + (e) Pyrotherapy.
- (78) *In every case of a doubtful swelling in any part of the body, do not forget syphilis, take Kahn*
- (79) A cancer can mimic a gumma very closely.
- (80) Absent knee jerk
- (a) Syphilis
 - (b) Old age
 - (c) Congenital
 - (d) Peripheral neuritis
 - (e) Diphtheria
- (81) *Prevention of iodism.*
- (a) *Raise the dose of pot. iodide*
 - (b) *Intravenous sod iodide 60-90 grs*
 - (c) *Oral mixture immediately before meals in plenty of water*
- (82) *Precautions in Diphtheria.*
- (a) *Strict isolation of*
 - (α) *Patient*
 - (β) *Attendants*
 - (b) *No attendant who has pharyngitis*
 - (c) *Face masks for all contacts*
 - (d) *Prophylactic antiserum for all contacts*
 - (e) *Destruction of infected material*
- (83) *Never examine a suspected diphtheria case without wearing a face mask.*
-

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